

CAZON  
NR 800  
-1992  
0011

Government of Ontario  
Publication

# Conserving Ontario's Old Growth Forest Ecosystems

*Final Report of the Old Growth Forests  
Policy Advisory Committee*



© 1994, Queen's Printer for Ontario

Printed in Ontario, Canada

Single copies of this publication are available at no charge from the address noted below. Bulk orders may involve charges.

Also available is "Highlights and Recommendations of the Final Report of the Policy Advisory Committee on Conserving Ontario's Old Growth Forest Ecosystems".

Current publications of the Ontario Ministry of Natural Resources, and price lists, are available through the Ministry of Natural Resources, Natural Resources Information Centre, M1-73, Macdonald Block, 900 Bay Street, Toronto, Ontario M7A 2C1 (personal shopping and mail orders).

ISBN 0-7778-3015-9





September 30, 1994



Dear Reader,

Attached is a copy of the Old Growth Policy Advisory Committee's final report on Conserving Ontario's Old Growth Forest Ecosystems.

This report provides valuable advice for the development of an overall old growth forest conservation strategy. It is complementary to the Crown Forest Sustainability Act, aimed at making sustainable forestry the law, and the Keep It Wild campaign, focused on completing Ontario's system of parks and protected areas.

The Old Growth Policy Advisory Committee has worked hard in preparing a report that the Ministry of Natural Resources will be able to utilize as it prepares its policies for the conservation of old growth forests in Ontario.

More than a thousand citizens of the province provided input to the Committee while they were developing this report. You now have the opportunity to review the Committee's recommendations and send your comments to me at the above address by January 31, 1995.


The final report was not signed by one member of the Policy Advisory Committee, Warren Mazurski. Mr. Mazurski agreed that the Committee's report reflects the basis of a conservation strategy, however he felt that more public consultation was required with respect to the boreal forest region of the province in order to achieve greater public support. His views are expressed in a letter on the next page. The additional opportunity for public comment until January 31, 1995 is one way to address this concern.

I look forward to hearing your views on the recommendations in this report and on conserving old growth forest ecosystems in Ontario.

Yours sincerely

Howard Hampton  
Minister





Digitized by the Internet Archive  
in 2022 with funding from  
University of Toronto

<https://archive.org/details/31761115472003>

AWK-7878





**Communications, Energy and Paperworkers Union of Canada**  
**Syndicat canadien des communications, de l'énergie et du papier**

**Ontario Region**

March 11, 1994

TO: ALL P.A.C. MEMBERS:

As a member of P.A.C. and a representative for workers on the committee, I must respond to the numerous requests from workers, labour councils, communities and forest industry for an opportunity to review and comment on the final recommendations that will be submitted to the Minister.

I respect and appreciate the fact that the committee's mandate is over on March 31, 1994 and further public review by the committee at this time is impossible. I therefore support the Minister of Natural Resources' announcement for additional consultation of our final recommendations after they have been submitted to him.

In recognizing that the Minister may amend or modify the recommendations after further public review, it is my position NOT TO SIGN OFF on the report, but to support the recommendations in principle. I believe the final recommendations do reflect the fundamental basis of a sound Conservation strategy for "Old Growth Forest", but do need the test of further public review.

Yours truly,

Warren Mazurski  
P.A.C. Member.

cc: J. McInnes, V. President, C.E.P. Ontario Region  
H. Hampton, Minister of Natural Resources

opeiu 343



701 Evans Ave., Suite 200, Etobicoke, ON M9C 1A3 Tel: (416) 622-2740 Fax: (416) 620-0781













July 21, 1994

The Honourable Howard Hampton  
Minister of Natural Resources  
Room 6301, Whitney Block  
99 Wellesley Street West  
Queen's Park, Toronto, Ontario  
M7A 1W3

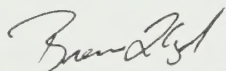
Dear Minister :

The Conservation Strategy for Old Growth Forest Ecosystems in Ontario, recommended to you by the Old Growth Forests Policy Advisory Committee and outlined in this report, is the product of over two years of reading, listening and contemplation by a nine member Committee. Appointed by cabinet, the Committee is made up of volunteers from across Ontario and reflective of the range of perspectives the people of this province bring to the discussion of old growth forests.

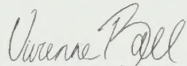
The Strategy reflects PAC's consensus on the many issues surrounding old growth forests and their conservation, and the recommendations, their rationale and background are supported by all members of the Committee.

The Old Growth Forests Policy Advisory Committee, with considerable assistance from the public, has developed a sound Conservation Strategy for Old Growth Forest Ecosystems in Ontario. No doubt it will be as challenging for the government to implement the Strategy as it has been for PAC and other participants in the process to develop one.

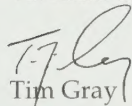
We end our work with an assurance to you that the people of Ontario are committed to the conservation ethic this report embodies, and we urge you to act now on their behalf.



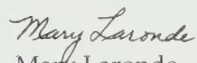
Brennain Lloyd (Chair)



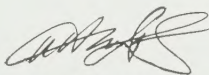
Vivienne Ball, R.P.F.



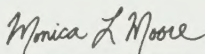
Tim Gray



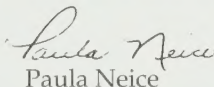
Mary Laronde



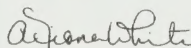
R.J. (Bill) McGuinty



Reverend Monica Moore



Paula Neice



Fiona White







An aerial photograph of a forest landscape. A winding river or stream flows through the center of the image, surrounded by dense, dark green forest. The river's path is light-colored, creating a stark contrast with the surrounding trees. The overall scene is a natural, undisturbed environment.

# Conserving Ontario's Old Growth Forest Ecosystems

*Final Report of the Old Growth Forests  
Policy Advisory Committee*

July, 1994





## Executive Summary

Ontario was once a largely forested province. Today, we still rely on our forests to provide many of the riches we enjoy, both economically and culturally; some communities rely on the forests for survival. But today, forests — especially old growth forests — are treasured for their intrinsic beauty, for their value as natural ecosystems, and as retreats from the pressures of daily life.

*"Old growth forests are a precious part of nature's legacy, a vital component of the diverse ecosystems of Ontario..."*

Honourable C.J. (Bud) Wildman, January 28, 1992

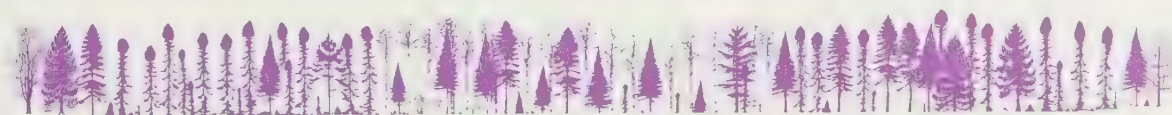
Around the province, there are different kinds of old growth forests. There are also different threats to their conservation. In the south, most of the deciduous forests have been cleared for agricultural and urban development, leaving only remnants of the great old forests. The future of these forests lies largely in the hands of individual property owners. In the Great Lakes-St. Lawrence Forest Region of central Ontario, towering white and red pines once dominated vast areas. Some magnificent stands still remain, but are threatened by our demand for forest products. The boreal forests of northern Ontario have experienced the least direct disturbance by humans in relative terms, but have been altered by fire suppression. Additionally, as the main contributor to the valuable pulp and paper industry, this forest is the subject of extensive industrial forestry.

Old growth forests help maintain biodiversity and they provide critical habitat for a multitude of species, such as pine martens and bald eagles. They also play a role in efforts to both understand and respond to global warming trends. Like all forests, they are valued for tourism, mining, hunting, logging and recreation, and for solitude and wilderness experiences. Some values are not compatible with industrial use, occasionally causing conflicts during resource allocation. Increasingly, the public has expressed concern about how these conflicts are resolved. Quite often, this concern is centred on old growth.

In January, 1992 the Ontario government announced the Old Growth Conservation Initiative and established the Old Growth Forests Policy Advisory Committee (PAC). The advisory committee was given a mandate to develop a strategy for conserving old growth forest ecosystems in the province.

### *The Policy Advisory Committee: Its Members, Mandate and Principles*

The Policy Advisory Committee reports directly to the Minister of Natural Resources and is an independent volunteer committee of citizens from across the province. The committee's membership reflects various perspectives on old growth: the forest and mining industries, labour, First Nations, environmental and conservation groups, and the faith and education communities.



The Minister asked PAC to: develop a framework for the conservation of old growth forest ecosystems; provide a working definition of old growth forest ecosystems; identify information needs for locating and cataloguing old growth; describe the particular biological, social, cultural, and economic values associated with old growth; identify suitable resource management practices; and recommend studies to gain a better understanding of the characteristics and values associated with old growth forest ecosystems.

At an early stage in its work, PAC adopted a number of principles on which to base the Conservation Strategy's development: protecting ecosystem function should be the highest priority in resource management decision-making; taking an ecosystem approach, considering species other than human and generations other than the present; considering fairly the social, cultural and economic impact of its recommendations; gaining public input as an integral part of the committee's work; and consensus-based decision-making.

Further, PAC recognized Aboriginal and treaty rights as affirmed by the 1982 Canadian Constitution, and the inherent right to self-government as acknowledged in the Statement of Political Relationship signed between the Ontario government and the First Nations.

PAC has been assisted in its work by a Scientific Advisory Committee, a Resource Managers Network, and a Secretariat provided by the Ontario Ministry of Natural Resources.

### *The Plan: Developing a Strategy*

To support its consultations, PAC produced two discussion papers during the development of the Conservation Strategy. The paper in 1992 discussed values and definitions of old growth forest ecosystems and conservation options for old growth red and white pine. In 1993, a second paper presented a landscape management approach and discussed possible protection, management and research strategies for the conservation of old growth forest ecosystems in Ontario.

The public consultation sessions included six meetings with more than 500 participants in 1992, and focused on defining old growth and assessing options for its conservation. In 1993, more than 750 people participated in workshops to discuss the final strategy. In addition to the public meetings and workshops, PAC received input through hundreds of questionnaires, letters and other submissions.

In June, 1993 PAC submitted the "Interim Report on Conserving Old Growth Red and White Pine." In developing the final report and strategy, PAC has addressed the entire forest in all parts of the province under various conditions of both public and private ownership.

### *Understanding Ontario's Forests*

In keeping with an ecological approach, PAC believes that a Conservation Strategy must be grounded in an understanding of the diversity of Ontario's forests, including wide-ranging environmental conditions, a variety of species associations and forest processes and the great array of human needs, values, and activities to which the forests





are subject. PAC has carefully considered the diversity of Ontario's forests in developing the following definition:

*"Old growth forest ecosystems are characterized by the presence of old trees and their associated plants, animals, and ecological processes. They show little or no evidence of human disturbance."*

The complex mosaic of Ontario's forests is a result of the factors which have shaped them — primarily climate, landforms, and disturbance. Forest ecosystems are dynamic, with plants, animals and micro-organisms living and interacting with each other and with the non-living components of their environment. Forest ecosystems are best described by their composition, structure, and function (the variety of plants and animals present; how the parts of the ecosystem, especially trees, are arranged relative to each other; and the ecological processes and the rates at which those processes occur). Forest ecosystems are part of the broader forest landscape, which includes lakes, rivers, streams, and wetlands.

Since the 18th century, forests in Ontario have been cleared for agricultural and urban development and have provided raw material for the forest industry. This use has resulted in the loss of forest area, soil and wildlife and aquatic habitat; reduced forest productivity; and changes in forest species composition and age class structure.

Ontario's forests form three distinct regions: the Boreal Region; the Great Lakes-St. Lawrence Region; and the Deciduous Region. These regions differ significantly in the species and ecosystems they support, types of forestry activity, and other expectations and demands placed on the forest.

**The Boreal Forest Region**, Ontario's largest, covers vast areas of northern Ontario. Forests in this area are fire disturbance - driven and dominated by white spruce and black spruce, jack pine, balsam fir, trembling aspen and white birch. Due to fire suppression, the boreal forest is generally aging beyond what would have been the case under natural circumstances. However, extensive cutting has removed large tracts of the older boreal forest.

**The Great Lakes-St. Lawrence Forest Region**, the province's second largest, contains a wide variety of tree species including red pine, white pine, red oak, white oak, hemlock, white birch, yellow birch and ash; maple is the most abundant deciduous tree. Despite two centuries of extensive logging, there are still significant remnants of old growth forest ecosystems.

**The Deciduous Forest Region** of southern Ontario is the northern tip of a forest region mainly located in the United States, stretching south to Tennessee and North Carolina. It contains an extensive mix of deciduous trees, including many species which reach their northern limit here, such as the tulip tree, cucumber tree, and Kentucky coffee tree.



## *A Conservation Strategy for Old Growth Forest Ecosystems*

**Goal:** To conserve Ontario's old growth forest ecosystems throughout the province.

Old growth forests are important ecologically, culturally, economically, and socially; locally, provincially and globally. And the next steps in conserving these important ecosystems must be taken without undue delay and with respect for the very many people who were involved in the development of the Conservation Strategy.

While all species associations are important, management priority should be given to those species which are most rare and threatened, such as the remaining portions of the Carolinian, or the red and white pine of the Great Lakes-St. Lawrence. Other Great Lakes species of concern may include hemlock and yellow birch. In the Boreal, an opportunity remains that is lost in most other parts of the province — to retain large undisturbed ecosystems. Lessons learned through lost opportunities further south and the dynamics of the Boreal forest which exist today make that opportunity an attractive one.

**Objective:** To provide an ecological context for the conservation of old growth forest ecosystems by planning for their presence in relation to the entire forest.

Old growth forest ecosystems do not exist in isolation from the rest of the landscape. As a key component of the changing landscape, they should be treated in the context in which they are found. By managing at a landscape level we consider all of the forest components; by planning at a landscape level we accommodate both protection and sustainable use.

In delivering the Conservation Strategy, taking a landscape approach will require :

- managing forest lands at a landscape level
- using the site district for the management scale
- developing and maintaining an integrated information system
- maintaining the diversity of ecological communities, ecosystems and wildlife species
- reassessing fire as a management tool to maintain natural forest processes
- conducting land use planning from a legislated basis across the province
- defining old growth forest ecosystems
- developing a set of indices for the identification, evaluation and monitoring of old growth forest ecosystems across Ontario, using age, area, disturbance, species diversity, structural diversity, and rarity as criteria.



**Objective: To protect representative old growth forest ecosystems across Ontario.**

In protected areas, natural processes are often allowed to continue and the forest can change and evolve with minimal human disturbance or disruption. Natural areas can be protected through different mechanisms, although the only mechanism in Ontario with a legal basis is the parks system, including provincial and national parks. Other jurisdictions have Ecological Reserves Acts, and in Ontario some protection is intended through the designation of a site as an ANSI, although that protection has no legal basis.

A protection program can be achieved by :

- establishing protected areas to provide ecological representation of old growth forest ecosystems on a site district basis;
- encouraging the protection of old growth forest ecosystems on private land by funding private land stewardship and by providing financial incentives, and identifying old growth forest ecosystems as ANSI's and/or Significant Woodlands and evaluating old growth forest ecosystems on private land.

**Objective: To perpetuate old growth forest features throughout the production forest, thus contributing to the maintenance of old growth forest ecosystem function and overall ecosystem function across the landscape.**

While protected areas make an important contribution to overall ecosystem and forest health, most forested land is outside of protected areas and must contribute to overall forest health. Ensuring the continued presence of old growth forest ecosystems and their function and features will help to achieve this. Important characteristics of old growth forest ecosystems can be retained through a variety of management techniques. Resource managers should aim to maintain old growth ecosystem function by managing to retain old growth characteristics and features.

An appropriate approach will include:

- using appropriate tools, including extended rotation ages, and silvicultural prescriptions to retain old growth features;
- requiring Forest Management Plans to describe how old growth forests will be perpetuated;
- including in the forest management plans a description of the tools selected to perpetuate old growth characteristics, and the results expected
- preparing plans that describe the management of old growth forest ecosystems;
- ensuring that private landowners are encouraged to manage their forests to perpetuate old growth forest features and/or functions;
- including management practices to perpetuate old growth forest characteristics in silvicultural and forest management guidelines, in OMNR staff training, and in the OMNR Demonstration Forest program.





**Objective:** To make resource management decisions in a fair and informed manner, fully considering the appropriate ecological, social, cultural and economic factors.

In its second year of work, the Committee examined a number of economic and evaluative models for resource management decision-making. Further to its review of existing models, PAC worked to develop a framework for socio-economic evaluation, with the help of expert resource people and participants at a multi-stakeholder workshop.

The outcome, the Integrated Evaluation Framework, identifies the values to be considered, outlines an approach to evaluation, and provides a decision-making process. The framework is one which should be applied in all resource management decision-making, not just in decisions about old growth forest ecosystems.

**Objective:** To promote increased knowledge and understanding of old growth forest ecosystems, and their ecological function and role in Ontario's forests.

Research into old growth forest ecosystems is relatively new, and scientific understanding is still limited in many respects. Many questions remain unanswered about old growth forests in Ontario, and knowledge will continue to grow over time, through research and observation. PAC proposes a 10-year research program that will allow initial monitoring of function and ecosystem changes.

More knowledge of old growth forests is needed if we are to judge the effectiveness of measures taken to retain old growth across the landscape, and to assess the objectives of the Conservation Strategy a decade from now.

**Objective:** To increase the public understanding of old growth forest ecosystems and their ecological, social, cultural and economic values.

With heightened public concern about the state of Ontario's forests, including old growth, and with increasing public involvement in resource management planning, it is essential that the public have access to sound information that will help to resolve concerns. Just as changes in management approaches must be integrated into the operation of OMNR to achieve old growth objectives in Ontario, so too must understanding and information about old growth forest ecosystems be made readily available to the general public. Information about old growth forest ecosystems should be integrated into OMNR information and education packages.



**Objective:** To assess the overall effectiveness of the Old Growth Conservation Strategy and its implementation.

The Conservation Strategy is based on scientific knowledge and broad public consultation, but, as with any policy or plan, it requires monitoring and evaluation of its effectiveness in meeting goals.

PAC's recommendation in its Interim Report focused on an audit program. That audit program should be expanded to be consistent with the Forest Policy Panel's recommended Adaptive Ecosystem Management, and with PAC's Final Report recommendations on effectiveness monitoring.

The Conservation Strategy for Old Growth Forest Ecosystems provides a clear process to identify and conserve these important forests. There is a role in this strategy for the people of Ontario and their government, the forest industries and the conservation and scientific communities.

No doubt it will be as challenging for the government to implement the Conservation Strategy as it has been for PAC and other participants in the process to develop it. But PAC's experience over the past two years indicates that, despite the obstacles, the people of Ontario share a strong desire to resolve the issues surrounding old growth, in the interests of the forests and all of us who care about them, live in them, and benefit from their natural wealth. With commitment and effort, the job can be done. Old growth forest ecosystems must be conserved.







# Acknowledgements

As we complete our two years of work to develop a Conservation Strategy for Old Growth Forest Ecosystems, the Policy Advisory Committee would like to thank the many people who gave of their time and ideas, told us of their hopes and their fears, and shared their experience and concern for the forests — young and old — of Ontario.

People helped us develop the strategy in many different ways. Thousands wrote to us or met with us to discuss old growth forests and how they should be conserved. Many provided professional assistance as advisers on the Scientific Advisory Committee or the Resource Managers Network, as writers or researchers, and as Secretariat staff. With the Committee often constrained by time, those individuals sacrificed personal time to provide the help we needed, and worked to our short deadlines and numerous requests for assistance. We thank them.

As volunteers, we would like to thank again our families, friends and employers for encouraging and supporting our work. We literally could not have done it without them, and appreciate the many times they had to do without us!

Finally, we would like to thank the Honourable Bud Wildman for his vision and foresight, for taking the first firm steps towards a Conservation Strategy for Old Growth Forest Ecosystems, and for giving us this opportunity to contribute to the conservation of Ontario's forests.





# Table of Contents

<b>Executive Summary .....</b>	<b>i</b>
<b>Acknowledgements .....</b>	<b>viii</b>
 <b>Chapter 1</b>	
<b>Introduction .....</b>	<b>1</b>
Background .....	2
Use of Words .....	4
A Plan for Action .....	5
 <b>Chapter 2</b>	
<b>Understanding Ontario's Forests .....</b>	<b>6</b>
How Forests Grow and Change .....	6
Forests and Ecosystems .....	7
Human Disturbances .....	8
The Forest Regions of Ontario .....	10
 <b>Chapter 3</b>	
<b>Old Growth Values .....</b>	<b>17</b>
 <b>Chapter 4</b>	
<b>Building a Conservation Strategy .....</b>	<b>19</b>
Resolving Old Growth Conflict .....	19
Old Growth Strategies in Other Jurisdictions .....	20
Conserving Old Growth Forests in Ontario .....	22
 <b>Chapter 5</b>	
<b>A Conservation Strategy for Old Growth Forest Ecosystems in Ontario .....</b>	<b>23</b>
1. Landscape Management .....	25
2. Protection .....	32
3. Forest Management .....	36
4. Integrated Evaluation Framework .....	40
5. Research .....	44
6. Education and Information .....	46
7. Implementation and Monitoring .....	47
<b>Closing Remarks .....</b>	<b>51</b>
<b>Chapter Notes .....</b>	<b>52</b>





Appendix A .....	59
Appendix B .....	60
Appendix C .....	61
Appendix D .....	62
Appendix E .....	63
Appendix F .....	68
Appendix G .....	71
Appendix H .....	73
Appendix I .....	74
Appendix J .....	77
 Bibliography .....	 79
 Glossary of Terms .....	 86



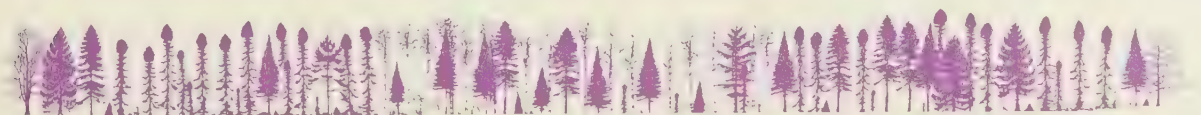
*"Old growth forests are a precious part of nature's legacy, a vital component of the diverse ecosystems of Ontario. They are, in a sense, nature's cathedrals - special places where we can feel and see the majesty of nature. If we lose all of our old growth forests, we lose the magnificent, spectacular beauty of these forests forever. We rob future generations of the chance to see forests in their natural state, before economic development began. We take from our children the chance to study for themselves untouched natural areas and make new discoveries about the secrets of the natural world. I believe the people of Ontario recognize the value of old growth forests and they want these forests conserved. Therefore, we are committed to ensuring that Ontario has a conservation strategy."*<sup>1</sup>

Honourable C. J. (Bud) Wildman, January 28, 1992

Ontario was once a largely forested province. Forests provided much of the wealth used by the people of this province to grow and prosper economically. Today, we still rely on our forests to provide many of the riches we enjoy, both economically and culturally; some communities rely on the forests for survival. But forests - especially old growth forests - are treasured for their intrinsic beauty, for their value as natural ecosystems and as retreats from the pressures of daily life.

Around the province, there are different kinds of old growth forests. There are also different threats to conservation. In the south, most of the deciduous forests have been cleared for agricultural and urban development, leaving only remnants of the great old forests. The future of these forests lies largely in the hands of individual property owners. In the Great Lakes-St. Lawrence Forest Region of central Ontario, towering white and red pines once dominated vast areas. Some magnificent stands still remain, but are threatened by our demand for forest products. The boreal forests of northern Ontario have experienced the least direct disturbance by humans in relative terms but have been altered by fire suppression. As the main contributor to the valuable pulp and paper industry, this forest is the subject of extensive industrial forestry.

Old growth forests help maintain biodiversity and they provide critical habitat for a multitude of species such as pine martens and bald eagles. Like all forests, they are valued for tourism, mining, hunting, logging, recreation and for solitude and wilderness experience. Some values are not compatible with industrial use, occasionally causing conflicts during resource allocation. Increasingly, the public has expressed concern about how these conflicts are resolved. Quite often, this concern is centred on old growth.



Old growth forests play a particular role in efforts to both understand and respond to global warming trends, not just by helping to stabilize greenhouse gasses and regulate carbon dioxide, but also in providing study areas by which to monitor the effects of global warming. As mature and complex ecosystems, old growth forests provide opportunities to measure effects and compare changes on a global basis. As both scientific interest and international public concerns rise, the importance of old growth ecosystems in the study of global warming will make these forests invaluable.

For the remaining old growth forest ecosystems in Ontario, be they relatively abundant or alarmingly rare, there is a choice in how they can be conserved. The Conservation Strategy for Old Growth Forest Ecosystems provides a clear process to identify and conserve old growth forest ecosystems and their values and characteristics. The Strategy provides a role for the people of Ontario and their government, the forest industries, and the conservation and scientific communities.

## Background

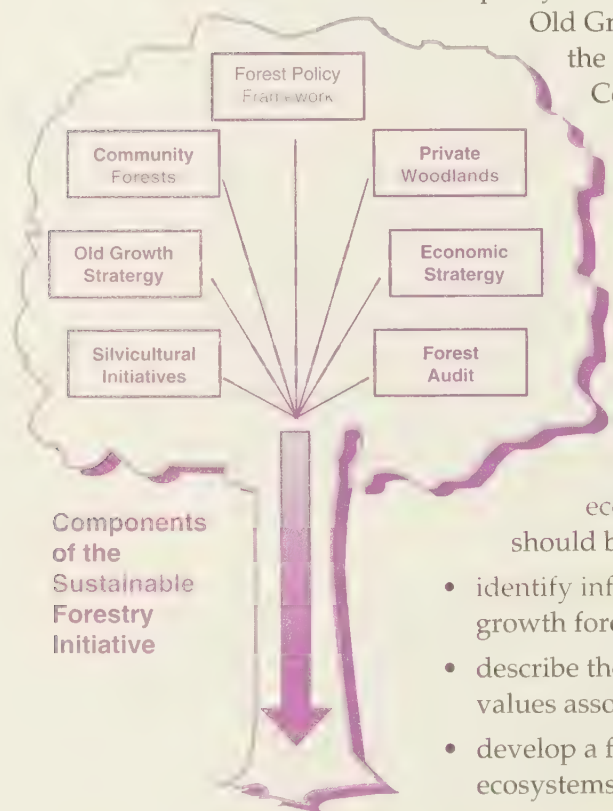
In its 1991 policy statement *Direction 90's*,<sup>2</sup> the Ontario Ministry of Natural Resources (OMNR) adopted the goal of sustainable development as expressed by the World Commission on Environment and Development, better known as the Brundtland Commission.<sup>3</sup> *Direction '90s* defined the Ministry's obligation as one of "developing sustainability," and committed the province to several important principles and a number of policy initiatives in resource management, including the development of a

policy framework for sustainable forestry.<sup>4</sup> In January 1992, the

Old Growth Conservation Initiative was established within the Sustainable Forestry Initiative.<sup>5</sup> As a major part of the Conservation Initiative, the Old Growth Forests Policy Advisory Committee (PAC) was given a mandate to develop and recommend a strategy to conserve old growth forest ecosystems in Ontario.

In establishing the Old Growth Initiative, the Minister recognized the many values and issues related to old growth forest ecosystems, and requested that the Committee work to:

- provide a working definition of old growth forest ecosystems and determine which forest ecosystems should be included for consideration as old growth;
- identify information needs for locating and cataloguing old growth forest ecosystems;
- describe the particular biological, social, cultural, and economic values associated with old growth;
- develop a framework for the conservation of old growth forest ecosystems now and into the future;
- identify appropriate resource management practices that may be used to maintain old growth characteristics;





- recommend studies required to gain a better understanding of the characteristics and values associated with old growth forest ecosystems.

PAC reports directly to the Minister of Natural Resources and is an independent volunteer committee of citizens from across the province. The committee's membership reflects various perspectives on old growth: the forest and mining industries, labour, Aboriginal peoples, environmental and conservation groups, and the faith and education communities. PAC members share an interest in old growth forest ecosystems, and in finding ways to ensure the long-term existence of these important ecosystems across the landscape.

PAC has been assisted in its work by a Scientific Advisory Committee, a Resource Managers Network and an OMNR Secretariat. The Scientific Advisory Committee, made up of natural and social scientists, has provided scientific information and advice. The Resource Managers Network, made up of resource managers from the public and private sectors, advised PAC on the operational implications of the Conservation Strategy as it was being developed. The Secretariat provided administrative and technical support.

At an early stage in its work, PAC adopted principles on which to base the Conservation Strategy's development:

- protecting ecosystem function should be the highest priority in resource management decision-making;
- an ecosystem approach is needed, meaning that species other than humans and generations other than this one be considered;
- fairness is needed, meaning that PAC will consider the social, cultural and economic impact of its recommendations;
- public input is an integral part of the development of the Conservation Strategy;
- the Committee will operate by consensus.

Further, PAC recognized Aboriginal and treaty rights as affirmed by the Constitution Act of 1982, and the inherent right to self-government as acknowledged in the Statement of Political Relationship signed between the Ontario government and representatives of First Nations in the province.<sup>6</sup>

In describing the Conservation Strategy, PAC often refers to land ownership and jurisdictional arrangements using phrases such as "public land", "private land" or "crown land". These terms, on the face of things, appear to exclude the indigenous peoples' reality and the authority of First Nations. However, PAC has accepted them on the basis of their common use, and recognizes that the paramouncy of aboriginal and treaty rights applies to the interpretation of such language.

Public consultation was a crucial element in the Committee's approach. To support its consultations, PAC produced two discussion papers during the development of the Conservation Strategy. The 1992 paper discussed values and definitions of old growth



forest ecosystems and conservation options for old growth red and white pine. In 1993, a second paper presented a landscape management approach and discussed possible protection, management and research strategies for the conservation of all old growth forest ecosystems in Ontario.

During its two years of work, PAC hosted two series of community meetings around the province and held several other consultative meetings. In 1992, the public consultation program included six workshops (attended by more than 500 people), a questionnaire (completed by 250 people) and a call for letters and submissions (almost 50 were received). Public input focused on defining old growth and identifying values and conservation options. In 1993, more than 750 people participated in four workshops, facilitated by local volunteers, by discussing the final strategy. In addition, more than 200 comment sheets were completed, and 64 letters and 8 submissions were received. The many people who were consulted — including tourist operators, hunters and anglers, Aborigines, environmentalists, forest industry workers and owners, naturalists and cottagers — helped to clarify strategic policy issues.

## *Use of Words*

During the development of the Conservation Strategy, the importance of clarifying a range of terms and expressions became obvious. People often use the same term to mean different things — or different terms to mean the same thing. One person's "protection" is another's "preservation"; one person's "mature forest ecosystem" is another's "decadent and decaying timber stand". In some cases, the lack of shared language simply reflects the relative newness of public discourse about old growth and forest issues. In other cases, language reflects conflicting priorities. The Committee decided how it would use a number of key terms. Perhaps the most central to its work was "conservation" itself, for which PAC adopted the International Union for the Conservation of Nature's definition:<sup>7</sup>

*The management of human use of ecosystems to ensure that such use is sustainable. Besides sustainable use, conservation includes protection, maintenance, rehabilitation, restoration, and enhancement of populations and ecosystems.*<sup>8</sup>

This definition includes the two main tracks of PAC's work: protection and sustainable use. At a landscape level, both are compatible and necessary parts of the Conservation Strategy. The approach to protection and sustainable use will ensure that representative samples of Ontario's old growth forest ecosystems remain intact, and that important characteristics of old growth forests are maintained during forest management operations.

As a key element of its work to develop the Conservation Strategy, PAC defined old growth forest ecosystems:

*Old growth forest ecosystems are characterized by the presence of old trees and their associated plants, animals, and ecological processes. They show little or no evidence of human disturbance.*



## *A Plan for Action*

In June 1993, PAC submitted its "Interim Report on Conserving Old Growth Red and White Pine" to the Minister of Natural Resources.<sup>9</sup> Now, PAC's Final Report is submitted to the Minister, with a request for timely consideration and action.

The vision of the Conservation Strategy for Old Growth Forest Ecosystems that PAC has developed addresses the entire forest, in all parts of the province, under various conditions of both public and private ownership. In keeping with an ecological approach, PAC believes that a Conservation Strategy must be grounded in an understanding of the diversity of Ontario's forests, including wide-ranging environmental conditions, the variety of species associations and forest processes, and the array of human needs, values, and activities to which the forests are subject.

No doubt it will be as challenging for the government to implement the Conservation Strategy as it has been for PAC and other participants in the process to develop it. But PAC's experience over the past two years indicates that, despite the obstacles, the people of Ontario share a strong desire to resolve the issues surrounding old growth, in the interests of the forests and all of us who care about them, live in them, and benefit from their natural wealth. With commitment and effort, the job can be done and old growth forest ecosystems will continue across Ontario's forested landscape.



*Some members of the Policy Advisory Committee studying an old growth stand in the Temagami area.*





Forests symbolize Canada; they are a dominant feature of our culture, economy, tradition and history. Three of Canada's eight forest regions — the Boreal, Great Lakes-St. Lawrence and Deciduous (also called the Carolinian) — are found in Ontario. Boundaries between the regions are transition zones rather than definite lines. Many species of animals and plants, including trees, are found in more than one region.<sup>1</sup>

The conservation of old growth forests must be based on an understanding of their diversity and how they function as ecosystems. The complex mosaic of Ontario's forests is a result of the factors which have shaped them — primarily climate, landforms, and disturbance.<sup>2</sup>

### *How Forests Grow and Change*

Climate, in the broadest sense, has been the major influence on Ontario's forests since the retreat of the glaciers and continuing to today. When the most recent glacier retreated from southern Ontario 11,000 years ago, plants and animals moved from south of the Great Lakes to inhabit the exposed newly land. At first, Southwestern Ontario was home to what we now consider Boreal species, then to the mixed-wood species now commonly associated with the Great Lakes-St. Lawrence Forest, and finally to the Deciduous Forest of today. The patterns of vegetation have responded to climate changes since glaciation. The major forest types in Ontario have not remained fixed over the thousands of years but rather, after an initial thrust north, have shifted position in response to changes in climate.<sup>3</sup>

Climate determines the composition and distribution of the forests in Ontario through factors like temperature, length of growing season and precipitation. For example, precipitation, landform, and soil types determine the amount of moisture a site contains. The moistness of the site largely determines the species that will grow there. Precipitation also has a major influence on the frequency, intensity and size of fires, which play a large role as a form of natural disturbance in forest regeneration and succession. Precipitation amounts range from 51 to 102 centimetres annually, with the north and west parts of the province generally drier than southern areas.<sup>4</sup>

Landforms influence forest composition through geology, altitude, and the angle and aspect of slopes. Ontario's topography is extremely varied in type and extent. In some parts of the province, large landforms provide uniform growing conditions, such as clay plains that favour species like black spruce. In other parts of the province, landforms are much more varied, and tend to produce complex vegetation mosaics.<sup>5</sup>

Soils influence where and how forests grow, while the forests, in turn, influence the soils. Northern forests are largely supported by layered soils that are acidic and low in nutrients; organic matter tends to decompose slowly. In the south, where brown forest soils are more nutrient-rich, decomposition and nutrient cycling are more rapid. Tree species tend to be associated with particular soil types: for example, jack pine is usually



found on sandy soils, although it also grows on loamy and thin soils over bedrock; black spruce grows on a range of soils from dry sands and fine textured mineral to organic soils; and sugar maple is associated with sandy loams, loamy sands and silt loams. Peat soils develop throughout the province wherever plant remnants accumulate more rapidly than they decompose.<sup>6</sup>

Based on climate and landform, Ontario is divided into 13 site regions and 65 site districts. The site regions are areas of land defined largely by similarities in climate and major landforms. A site district is a subdivision of a site region, and is based on topography, soil, and plant communities. The site district is the basic planning unit for OMNR's protection of natural areas.<sup>7</sup>

## *Forests as Ecosystems*

Ecosystems come in many sizes, from small rotting logs to vast landscapes. Forest ecosystems are often "classified," or put into groups with similar characteristics. These can be described as ecosystem types, communities, species associations, stands or eco-elements. The forest stand is an ecosystem unit that is easy to visualize. It can be a few hectares to a few hundred hectares in area, and occasionally even smaller or larger.

Forest ecosystems are dynamic, with plants, animals and micro-organisms living together and interacting with each other and with the non-living components of their environment. Forest ecosystems are best described by considering their *composition*, the variety of plants and animals present in the ecosystem; their *structure*, how the parts of the ecosystem, especially trees, are arranged relative to each other; and *function*, the ecological processes and the rates at which those processes occur (such as production of organic matter and cycling of nutrients). Forest ecosystems are part of the broader forest landscape, which includes lakes, rivers, streams, and wetlands.<sup>8</sup>

Long-term change happens in the forest due to changes in climate. On a shorter time scale, changes are described in terms of *succession*, a natural progression of life in the forest, where one plant community or association is replaced by another.

Succession can be studied at various scales, from forest stands to entire forests or landscapes. Slow successional change happens when individual trees die in the forest, producing



*A post-fire landscape contains a mix of burned, unburned and partially burned areas.*

Tim Gray





openings for new ones. Death of individual trees or minor disturbances, such as those caused by light fires or windthrow, may result in a forest composed of many different ages.

Major changes in the overall successional state of a forest can occur after large scale disturbances. Even-aged stands tend to develop after this type of disturbance and may consist of trees of a single species, or they may consist of several dominant trees species.

All forest associations may enter an old growth stage<sup>9</sup>. Some, such as those dominated by relatively short-lived species, such as jack pine, may pass through their old growth phase relatively quickly. On the other hand, forest associations dominated by long-lived species such as sugar maple, may develop and maintain old growth characteristics for centuries. Some old growth stands are self-perpetuating, such as those in the Deciduous Forest, while others, such as several in the Boreal, are more likely to be replaced by other species associations.<sup>10</sup>

## *Human Disturbance*

Since the 18th century, forests in Ontario have been cleared for agricultural and urban development and have provided raw material for the forest industry. This use has resulted in a loss of forest area, soil and wildlife and aquatic habitat; reduced forest productivity; and changes in forest composition and age structures.

During the early years of European settlement, fires frequently burned cut-over areas. Forest fires generally favour regeneration of conifers. However, if coniferous seed-parent trees have been removed by timber harvest, fires may favour deciduous species. With improved fire suppression over the past 70 years, fire frequency has decreased. Regional differences in natural fire frequency are great. For example, a very short frequency of 20 years is found in jack pine areas in the Sachigo Hills in the northwest; a moderate time of 70 to 80 years in central Algonquin and northwestern Quetico Provincial Parks; and a longer frequency of 135 years in parts of the northeastern Clay Belt. Efficient fire suppression has affected the age class distribution of forests, particularly in the Boreal Forest. Stands which normally would have burned in the days before fire suppression may now continue to age.<sup>11</sup>

Forest management, including timber harvesting and renewal, has a major impact on the species composition and age structure of forests. Harvesting has concentrated on mature and over-mature natural stands. Maturity is judged by foresters to be the age when the growth rate of a tree begins to slow down. These older stands are expected to continue to be the main source of raw material for the forest industry.<sup>12</sup>

Some long-term effects of human disturbance on forest ecosystems were not anticipated. For example, after high-grading operations, trees left in the harvested area may contain genes that produce slow growth, maladaptation to the local environment and poor tolerance to insect and disease attack. Many of these characteristics may be passed to future generations.<sup>13</sup>





Many areas that were remote in the early years of the forest industry are now accessible by road. As a result, the inappropriate use of heavy equipment on some sites has caused erosion or flooding. Increased utilization standards for both coniferous and deciduous species often results in the total removal of all trees within a cutting block. The forest industry is, however, increasingly matching equipment type to specific areas to ensure that site productivity is not adversely affected or that smaller remaining trees are not damaged.

Some facts on the province's forests:

- in 1991, the conifer harvest was approximately 17 million cubic metres;
- the deciduous (hardwood) harvest was about 8.1 million cubic metres;
- the harvested area was approximately 200,000 hectares;<sup>14</sup>
- an increased future demand for timber supplies is generally expected, with particular emphasis on hardwood supplies;<sup>15</sup>
- the forests of Ontario generate approximately \$10 billion worth of wood products annually;
- stumpage-related revenues (fees paid by the forest industry for cutting trees) amounted to \$90 million in 1989 for the provincial government;
- the forest industry in Ontario employs approximately 64,000 people;
- the province received direct payments of \$11 million from parks revenue and \$33 million from fish and wildlife revenue in 1989;
- more than \$350 million were spent on forest management by the provincial and federal governments in 1991.<sup>16</sup>

Increasing mechanization and the use of new technology, which began in the 1940s and 1950s, is one of the major causes of job loss in the forest industry — a trend which continues today as a function of the industry's interest in reducing operating costs. At the same time as employment has dropped, production has increased dramatically.

### ***Labour Trends In The Forest Industry of Ontario***

*(Figures are five-year annual averages; Production measured by volume harvested and paper and paper board production. <sup>17</sup>)*

Period	Logging (No. of workers)	Volume Harvested (1,000 cubic Metres)	Paper and Allied Industries (No. of workers)	Paper and Paper Board Production (Million tonnes)
1970-74	8,826	16,693	45,218	3.02
1975-79	8,684	17,540	45,138	2.80
1980-84	8,562	21,281	43,906	3.46
1985-89	7,915	28,516	41,953	4.05



# The Forest Regions of Ontario

Ontario's forests form three distinct regions : the Boreal Region; the Great Lakes-St. Lawrence Region; and the Deciduous Region. These regions differ significantly in the species and ecosystems they support, types of forestry activity, and other expectations and demands placed on the forest.<sup>18</sup>

## The Boreal Region

The Boreal Forest, the most northerly of Ontario's three forest regions, is also the largest. The land is low in relief (not more than 300 m altitude) and for the most part slopes gently to the Arctic Ocean. Much is poorly drained. Features include rock outcrops, moraines, glacio-fluvial sands and gravels (often in ridges), clay plains and large areas of peat. Some peatlands have a characteristic arrangement of ridges alternating with pools. The species tend to be associated with particular soil or relief conditions. For example, black spruce and tamarack are frequent on peatlands and bogs, while trembling aspen, white birch and jack pine are on well drained sites. Due to short summers and generally acidic soil conditions, decomposition of organic matter and the turnover of nutrients is slow, relative to more southerly areas.

The Boreal forest supports a rich fauna of bird and mammal species, but few amphibians and reptiles. Many birds migrate from the tropics to breed here, and feed on the abundant insects and other invertebrates. Several bird species reach their highest densities in these forests, including the palm warbler, orange crowned warbler, blackpoll warbler and Wilson's warbler. The three-toed woodpecker and mammals like the lynx, woodland caribou and arctic shrew are year-round residents and are found primarily in this forest region.

The Boreal forest mosaic has in large measure been determined by the size, intensity, and frequency of fires that have burned across the landscape. In the past, before fire suppression, forests over 100 years old are likely to have been uncommon, and would mostly have been found in low-lying wet areas or on topographic features that gave protection from fire. Although these stands were not plentiful, they did provide important wildlife habitat and were an integral part of the structural and biological diversity of the forest. After 70 years of fire suppression, larger areas of the forest may have grown older. Due to fire suppression the boreal forest is generally aging beyond what would have been the case under natural circumstances. However, extensive cutting has removed large tracts of the boreal forest.

## Boreal Forest Region

The region has few people, vast distances, and widely dispersed communities dependent on the mining, forest products and tourism industries. The largest towns are located mostly along the Trans-Canada Highway. Many Aboriginal communities have year-round access only by air.





The resource-based economy is vulnerable to business cycles that affect the demand for minerals and forest products, as well as by the limits of the resources. Sometimes, forest product companies or mines close as the natural resource is depleted.

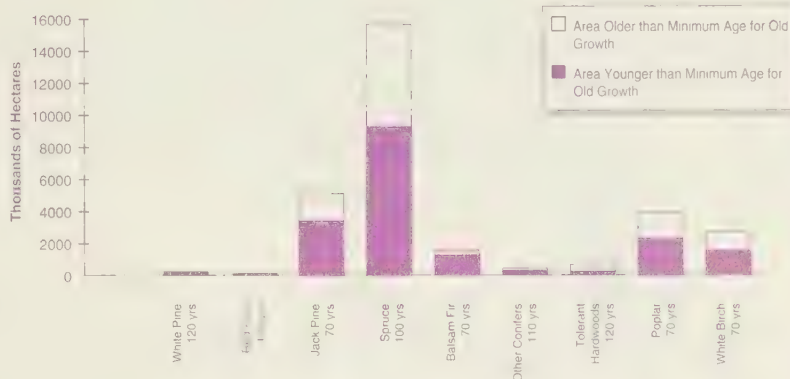
In 1992, there were 41 sawmills, 11 pulp and paper mills, 8 board mills, 6 mills for assorted forest products, and 4 veneer /plywood mills under license.<sup>20</sup> Wood consumption was 82 per cent coniferous and 18 per cent deciduous, mostly poplar and birch. Demand for pulp, paper and softwood lumber is expected to remain steady over the next two decades, and there is an anticipated increase in the demand for hardwood as new mills are opened.

Almost all of the timber harvested comes from Crown land. Forest Management Agreements (contractual agreements between OMNR and individual companies) cover about 60 per cent of the productive forest, with the remainder mostly in Crown management units, and a small amount in private ownership.

According to the Northern Ontario Tourist Outfitters Association, there are currently about 1,600 tourist facilities in northern Ontario. In the early 1990s, revenues were estimated at \$250 million. The industry directly provides up to 20,000 permanent and seasonal jobs each year.<sup>21</sup>

Aboriginal people use the Boreal Forest extensively for a variety of social, subsistence and economic activities, including trapping, hunting, gathering food and medicinal plants, and home building. For example, approximately 3,300 status Indian trappers harvest furs.<sup>22</sup>

## Areas of Potential Old Growth in the Boreal Forest Region<sup>19</sup>



See Appendix I for identification of "minimum age for old growth" by species association.



### White Spruce

White spruce can live more than 200 years and grow to 28 metres. Rarely growing in pure stands, older mixed stands often also contain balsam fir, aspen, balsam poplar and white birch. These provide good winter habitat for moose and feeding and nesting areas for pine gros beaks.



### Black Spruce

Old growth black spruce can grow on a wide range of sites from peatlands to mineral soils. It is often associated with tamarack, white cedar, alder, willows, labrador tea, sphagnum and feather mosses. Stands may be even-aged if they start after a fire. In older stands, regeneration can include layering, the rooting of low hanging branches. Often, a genotype, a certain gene set, is continuously reproduced for centuries by layering. Old stands are habitat for the rare Connecticut warbler, red cross bills, pine martens and red-backed voles.





### ***The Great Lakes-St. Lawrence Forest Region***

The Great Lakes-St. Lawrence Region, the second largest in Ontario, is home to about 60 species of trees. Dominant ones include white pine, red pine, eastern white cedar, hemlock, tamarack, black spruce, white spruce, sugar maple, red oak, white oak, basswood, ash, aspen and white birch. Stands characteristically include a number of tree species, with several dominants. The physiography of the region is highly varied, with plains, rugged terrain, and hilly areas such as the La Cloche Mountains and the Madawaska Highlands. The region contains the highest elevations in the province, most less than 500 metres, but some reaching 700 metres. Because the height of land crosses this forest area, river systems drain to both the Atlantic and Arctic oceans.

Varied soils and topography support a wide variety of tree species associations, including white and red pine on well-drained sites, and black spruce, white cedar, and tamarack in organic soils. Sugar maple is the most abundant deciduous tree, with red and white oak, basswood, aspen, white and yellow birch, and ash also quite common. Red oak often dominates well-drained areas, while sugar maple is most abundant on moist sites. Stands characteristically include a number of tree species, with several dominating.

There is a great diversity of habitat, animals, and plants in the Great Lakes-St. Lawrence Region. In parts of the region, where the climate is moderated by the Great Lakes, "southern" species can overwinter, resulting in the diversity of amphibians and reptiles being somewhat higher than in the Boreal or than it would be without the lake effect. While the white-tailed deer population is higher here than in the Boreal, moose are less common. Two of the most common forest songbirds are the chestnut sided warbler and the veery.

This forest has been influenced by humans for a longer period than the Boreal region, and clearly the age structure and composition of the forest have been heavily affected by human activities.

The area south of the Canadian Shield is now covered by approximately 30 per cent forest, compared to an estimate of upwards to 90 per cent prior to European settlement. Much of the remaining forest has either been clear cut or selectively logged.<sup>23</sup> The frequency and extent of fire increased as land was logged or cleared for farming, and these fires had an important effect on forest succession and composition. Fire still plays a role in forest succession, but timber harvesting has replaced fire as the greatest disturbance factor.<sup>24</sup>

Despite two centuries of clearing land and timber harvesting, there are still significant remnants of magnificent old growth forests of white and red pine, eastern white cedar, hemlock and tolerant hardwoods such as maples and oaks.<sup>25</sup>



Because many tree species live longer in the Great Lakes-St. Lawrence Region than in the boreal, and since there is less catastrophic fire, old growth forests were relatively wide spread before the 18th century. Since most of these forests have been logged at least once, the forest is now fragmented, with the amount of old growth forest dwindling rapidly. Post-logging regeneration of species such as white pine, hemlock, yellow birch, red oak, black cherry and basswood is problematic.

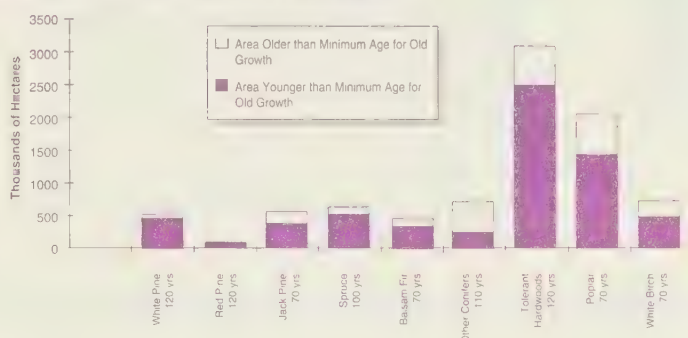
Aboriginal people continue to have strong ties to this forest, considering it not just a resource, but a homeland and integral to their cultural and social identity as well as a source of sustenance.

Land use patterns established during the 1800s by European immigrants largely continue to this day, particularly in the northern part of the region where numerous small, resource dependent communities are dispersed along the main railways, roads, and waterways. Land ownership ranges from 95 per cent Crown land in the northwest of the region to 85 per cent private land in the south. While there is some farming throughout the region, it is more common in the southern part. It is also home to tourism and the cottage country of Haliburton, the Muskokas and Thousand Islands.

As the province developed and the population grew, the southern portion of the Great Lakes-St. Lawrence Region became a major tourism and recreation area. In 1893, the provincial government established Algonquin Provincial Park, the first piece of Ontario's parks system.

In the eastern part of this region, timber harvesting comprises about 60 per cent softwoods, including red, white and jack pines, and white and black spruce. The remaining 40 per cent harvested is hardwood, with sugar maple, poplar, and white birch the dominant species. In the northwest, the harvest is mostly softwood, used mainly for pulp production.

### *Areas of Potential Old Growth in the Great Lakes - Saint Lawrence Forest Region <sup>26</sup>*



*See Appendix I for identification of "minimum age for old growth" by species association.*

### **Eastern Hemlock**



Hemlock can live over 600 years and reach 24 metres in height. It occurs both in pure stands with little undergrowth or in mixed stands with sugar maple, beech or yellow birch. Seedlings often grow in old logs, but regeneration after logging is poor. Young hemlocks are eaten by deer and moose and hemlock stands are often winter habitat for white-tailed deer. Blackburnian and black-throated green warblers can also be found here, among others.







### *Eastern White Cedar*

The old growth white cedar forest on the Niagara Escarpment is possibly the most extensive and least disturbed old growth forest in eastern North America. The trees range in age from seedlings to 1,000 years old and appear to be regenerating successfully. Historical records show that this forest, while still relatively extensive, has been reduced from its former size.<sup>29</sup> This forested corridor provides an important resting place for migrating birds such as the golden crowned kinglet.

In 1992, the region's forest industry included 79 saw mills, 12 mills for assorted forest products, 9 veneer / plywood mills, 7 pulp and paper mills, and 2 oriented strand board mills. In addition, there are many small non-licensed mills.<sup>27</sup> In the central area, lumber is the pre-dominant forest industry product, relying on old growth forests as a source of wood supply. This is especially true of mills which produce white and red pine lumber. Increased demand for panel board and pulpwood may increase the number of tree species harvested.<sup>28</sup>

### *The Deciduous Forest Region*

The Deciduous Forest Region, dominated by deciduous trees, is the smallest of Ontario's forest regions.<sup>30</sup> It is also the region with the least forest cover, because of massive clearing for agricultural and urban development. The Deciduous Forest of Ontario, also called the Carolinian forest, is the northern tip of a forest region located mostly in the United States, where it covers a large area south to Tennessee and North Carolina and from the Atlantic Coast to the Mississippi River. Many deciduous tree species reach their northern limits here: tulip tree, cucumber tree, Kentucky coffee tree, black gum and pin oak. Most of Ontario's black walnut, sycamore and swamp white oak trees grow here. Some stands of white pine, tamarack, eastern red cedar and eastern hemlock are also found.<sup>31</sup>



**Deciduous  
Forest Region**

The underlying limestone is covered by surface deposits that range in texture from gravels to clays. Topographic conditions are uniform throughout, with areas of steep local relief. Summers are long with moderate amounts of rainfall and the winters are relatively mild with low snowfall.

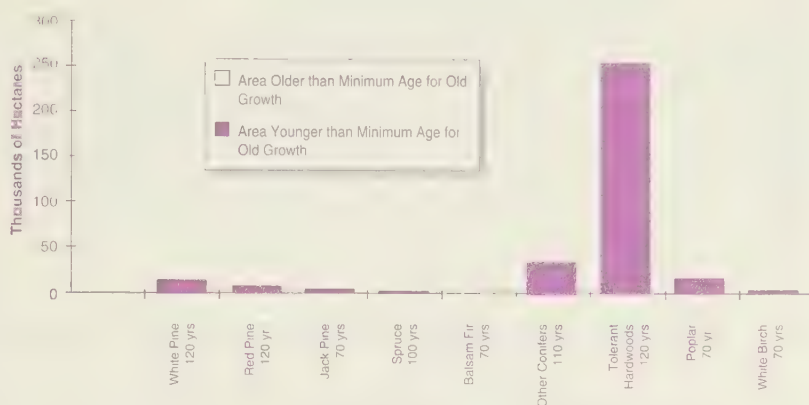
Before agricultural clearing in the 19th century, there was a great variety of forest species. Well drained upland areas and supported stands of red oak, black oak and white oak, often with a scattering of hickory. White pine was also associated with oak on extremely dry sites in the more northerly sections of this region. Moist sites supported sugar maple and beech, with red maple, hemlock, elm, red oak, and bur oak. On wet sites, American elm and sugar maple were abundant, while silver maple and American elm were both abundant in bottomlands.





Despite deforestation, forest remnants in the Deciduous Region still feature a high diversity of plants and animals. The southern location, combined with the moderating influence of the Great Lakes, permits the growth of Carolinian trees such as the Kentucky coffee tree, sassafras, flowering dogwood, pignut, and a variety of oaks. Some animals also reach their northern limits here, including opossum and some snake species. Due to the rich forests and warm climate, a number of animal species are unique to the Deciduous Region. Examples are the southern flying squirrel, opossum, pine vole, red-bellied woodpecker, and Carolina wren. Over 40% of the rare, threatened and endangered wildlife species in Canada are found here, primarily because of habitat loss.<sup>31</sup>

### *Areas of Potential Old Growth in the Deciduous Forest Region<sup>32</sup>*



See Appendix I for identification of "minimum age for old growth" by species association.

Windthrow, individual tree death, insect damage, and disease were presumably the main agents of natural disturbance in the Deciduous Forest prior to European settlement. It is unlikely that fire played a major role in much of this forest, although it was locally important in the savannah communities, and was used extensively by Aboriginal people in agriculture and managing vegetation. The lack of catastrophic disturbances resulted in old growth stands being common before European settlement. Backus Woods, a 265-hectare woodland near Simcoe, is an example of mature Carolinian forest, and retains the characteristics of old growth forest ecosystems, as well as providing critical forest cover and habitat.



#### **Silver Maple**

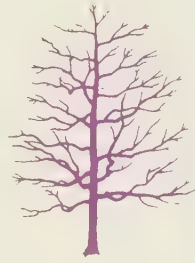
Silver maple can live more than 130 years and grow to 30 metres. These stands occur in spring-flooded bottomlands and as a result, many have escaped being cleared for development. Silver maple swamps are often preferred sites for Great Blue Heron rookeries.

The Deciduous Forest is the region of Ontario with the least forest cover. By the early 1900s, most of the land suitable for agriculture had been cleared. The forests are now mostly restricted to areas with low agricultural potential, such as sand plains, floodplains and wet bottomlands, and even these forests have been greatly modified by human activities. Although some of the abandoned sandy areas have regenerated to native deciduous trees, many have been reforested to coniferous species. The remaining



### *Red and White Oak*

These oaks can live for several centuries. Some stands occur in savannas, where well-spaced individuals grow amongst prairie-like vegetation. In mixed stands, oaks produce acorns that attract wildlife and provide an important food source. The mourning cloak butterfly overwinters as a pupa in crevices in the bark of oak trees.



forested areas have been significantly affected by grazing and by tree cutting for fuelwood and other forest products. In the 1960s, farm fields were enlarged to accommodate increased agricultural mechanization, thus further reducing the size of natural areas in the region to the point where the average size is now less than three hectares.

Europeans settled here at the end of the 18th century. Although making up less than one per cent of Canada's land mass, the region is now home to more than 25 per cent of the country's population.

The Carolinian forest's contribution to the forest industry in Ontario is minimal. The hardwood most commonly cut is maple, oak, poplar and birch. There are 30 licensed sawmills, 4 mills for assorted forest products, 1 pulp and paper mill and 1 veneer/plywood mill. There are also many non-licensed mills.<sup>33</sup>

Protected areas have high recreational and tourism values and contribute to the economy of local communities. Nature appreciation attracts people from across Canada and the United States to view birds and the vegetation associated with the Carolinian Forest. Places such as the Long Point Bird Observatory, Rondeau Provincial Park and Point Pelee National Park are famous bird-watching locations.<sup>34</sup>

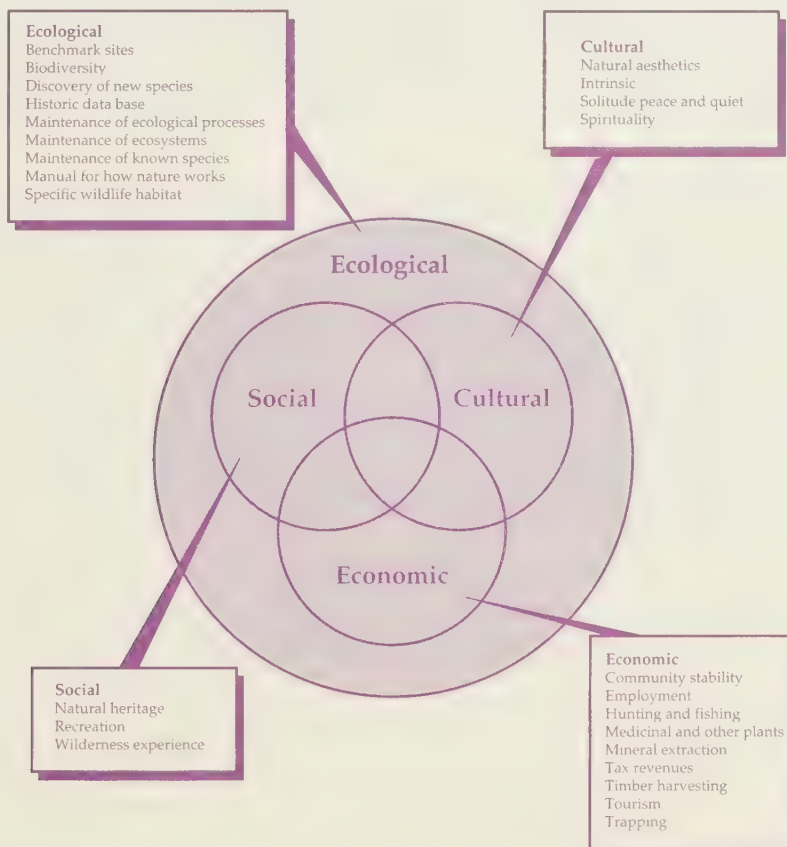


*"We're talking about moral decisions. How much are we going to protect? What do we protect? Science will give you more facts, and you'll understand the ecosystem better, but you still have to make the moral decisions."*

Participant in 1992 Pembroke workshop

What is it that people value about old growth forests? Do the values exist inherently regardless of whether they are held by humans? How do we express the values we hold so that others can understand and respect them?

In the two years of developing the Conservation Strategy, PAC received hundreds of letters, cards and telephone calls. Of the hundreds of people who participated in community meetings, many told PAC what they value in old growth forest ecosystems. These values can be generally grouped into four areas: ecological; cultural; social; economic.





These values interlock and overlap. For example, community stability and employment are listed with economic values but they are also social values. In the analysis of the public consultation, the wilderness experience and natural heritage values were grouped together as social values, but natural heritage is also a cultural value.

*"...all of our rights flow from our relationship to the land. Our lives, our culture and our continued existence as a people are completely tied to the land in the area in which our ancestors have lived since time immemorial."*

Chief James Grosnell

All of these values are very important to some of Ontario's citizens, and most are important to everyone, to one degree or another. For Aboriginal people, the forest holds many values - it, in fact, holds life itself. The Cree people have more than 200 words to describe the forest in its many different conditions and with its many different gifts: "the forest that hasn't been touched"; "the place that produces a lot of food", and the mature or old growth forest - "the forest you can see through". The primacy of ecological values — the idea that without healthy ecosystems everything is in jeopardy — is generally accepted, as is the concern about the long-term economic health of northern communities.

Protection of important and representative old growth areas is seen by most people as necessary to retain many of the benefits for which we value old growth forests. The need for wilderness is accepted for a variety of reasons, but with some differences about how much forest land should be reserved as wilderness. Aesthetic, emotional, philosophical and spiritual values are harder to translate into policy options.

The values identified by the Ontario Forest Policy Panel are consistent with those identified by PAC<sup>1</sup>. In its final report, "Diversity"<sup>2</sup>, the Forest Policy Panel identified three major categories of values: legacy, social and material. While the groupings are somewhat different from PAC's, the conclusion is similar — the people of Ontario place a high value on their forests.

The values people hold for all forests are also held for old growth forests, but some values are more strongly held in the case of old growth. This is a sense motivated in most people by a belief that old growth forest ecosystems are more rare and are wild or undisturbed. Some people treasure old growth ecosystems simply because they are old forests. Also, old growth forest ecosystems have certain ecological values which are not common in younger forests, such as habitat for a particular species. The stability of the old growth forest ecosystem allows particular types of research and study which are not possible in forest ecosystems of other ages. Perhaps most important of all is that, to have healthy forests<sup>3</sup> over the entire landscape, it is necessary to have healthy old growth forest ecosystems as part of that landscape.



### *Resolving Old Growth Conflict*

As the Conservation Strategy for Old Growth Forest Ecosystems was developed, many of the debates and conflicts regarding resource management and forest policies and planning were stimulated. Numerous values that are held for the forest in general are also held for old growth forests, but often in an amplified sense — amplified because of the increasing rarity of the ecosystems in parts of Ontario, and the heightened value and concern that results from that rarity.

There is a growing sense held by the public that it has both a right and a responsibility to be involved in making decisions about the forests. At the same time, the forest industry feels increasing pressure, due to a weakened economy and a myriad of government policy initiatives that could bring a newer, more demanding work environment. Wood supply shortages, increased uncertainty and pressures due to global markets and international competition are additional challenges the industry is facing.

Old growth forests in Ontario made headlines in the late 1980s when controversy escalated over logging the old growth red and white pine forests of Temagami. The elements for a confrontation were certainly present: a long struggle for an Aboriginal land settlement (still underway), well-organized seasonal residents, a troubled forest industry, international environmental concerns about logging of the old growth forests, and a depressed regional economy. The conflict in Temagami had brewed for more than a century, but public and political attention was captured by seven road blockades and counter-blockades, hundreds of arrests, and millions of dollars spent on policing and the construction of a much-contested road.

More recently, in the summer of 1993, national headlines were dominated by another land dispute with many of the same elements. This time it was in British Columbia, where the provincial government decided to allow logging in the old growth forests at Clayoquot Sound on the west coast of Vancouver Island. Environmentalists reason that since the area is among the last of the old growth temperate rain forest on the British Columbia coast, it should be protected. The forest industry describes its logging practices as sustainable and explains that logging the disputed area is necessary to provide local employment. The British Columbia government says it has achieved a compromise acceptable to the public. The conflict over Clayoquot Sound has gained international attention, possibly jeopardizing the Canadian forest industry's overseas markets.

The issues are similar, with concerns about the disappearance of ecosystems and jobs heading most people's priority lists. The costs are also similar, with communities being divided and positions being taken that make heavy demands on the energy, stamina and patience of all sides.







Ministry of Natural Resources

*Many communities in the Great Lakes - St. Lawrence region prospered during the early days of the forest industry.*

In Ontario, there *is* a public consensus generally held around old growth forests. For the most part, the people of the province agree that we need healthy forests *and* we need a healthy forest industry, and that protecting representative samples of old growth forest ecosystems is part of the former, and improving forest management practices is essential to the latter. There is a common interest in achieving some level of certainty — to know there are principles and guidelines which will be followed to achieve both healthy forest ecosystems and a healthy industry, and to know where we are headed, whether we identify with industry, the natural world, or communities. But the public

consensus is not absolute, leaving many contentious issues:

- How much old growth should be protected?
- How should it be protected?
- What logging practices are acceptable?
- How should provincial policy be developed, given that the forest regions across the province are so different?
- What is the role of local communities?
- How do we account for Aboriginal, provincial and global interests?
- How do we balance jobs today against jobs tomorrow?

Just as many of the elements of conflict around old growth forest ecosystems are common to debates about the future of the forests and natural resources in general, so too are some of the solutions: fair and informed consideration of ecological and social concerns, public involvement in developing policy and making decisions and a transparent process for making decisions.

## *Old Growth Strategies in Other Jurisdictions*

Many other provinces in Canada, as well as state and federal resource management agencies in the United States, are developing old growth conservation strategies. Not surprisingly, the strategies have many elements in common, including:

- **DEFINITIONS** of old growth tend to approximate the composition, structure and function of native forests. Old growth forests represent the later stages of succession in the forested ecosystems. Age and specific characteristics vary according to forest type, climate, site condition and type of disturbance. In the “Old Growth Strategy for British Columbia”, the definition reads: “Old growth forests are natural stands of old and young trees and their associated plants, animals and ecological relation-





*ships, which have remained essentially undisturbed by humans. ”1*

- VALUE LISTS consistently include habitat (wildlife and fish), biodiversity (species, gene pools, landscape), historic data base, soil productivity, water quality, ecological reference points, aesthetics, spiritual needs, industrial raw material, education and heritage appreciation, benchmarks (reference points) for monitoring and assessing people’s impact on forest ecosystems.
- CONSERVATION is generally defined as including protection and sustainable use. The urgency for protection depends on the amount of old growth forests remaining across the landscape in the jurisdiction under discussion.
- PROTECTED AREAS are consistently described as needing to be large enough to protect ecological integrity.
- BIODIVERSITY and its conservation is a focus.
- YOUNG FORESTS, and the need to maintain them and all age classes, as part of a long-term Strategy for old growth forests, are frequently included.
- SPECIAL MANAGEMENT PRACTICES for old growth features outside protected areas are common.
- PRIVATE LAND is suggested for consideration with governments providing support and education for landowners.

In Canada, forest management is mainly controlled by the provincial governments. Every province appears to have taken a different approach — sometimes dramatically — due to different forest types, the history and extent of forestry operations and differences in land use patterns and public attitudes. The only province with an old growth strategy is British Columbia. Ontario’s neighbouring provinces, Manitoba and Quebec, do not have conservation strategies or policies for old growth forests. However, Manitoba does use the classification “old forest”.

PAC’s review of different strategies revealed that frameworks to conserve old growth forest ecosystems generally meet three major requirements:

- identify and protect old growth forest ecosystems;
- examine the management of the forest landscape, and how old growth forests fit into that landscape;
- identify the potential for restoring forest lands to a condition that might be similar to an old growth condition, or that is functionally supportive of adjacent old growth forest ecosystems.

While an Old Growth Conservation Strategy focuses on old growth forest ecosystems, the dynamic and interactive nature of forests do not permit for policy or management decisions to rigidly segregate them from the rest of the forest landscape.



## *Conserving Old Growth Forests in Ontario*

In Ontario, a number of circumstances have served as defining influences in the development of a conservation strategy for old growth forest ecosystems. Ontario has a large and diverse forest, with varied forest types, land use patterns and distinct social and economic expectations. These disparities require a conservation strategy to be broad in its provincial approach and flexible in regional and local implementation. The Old Growth Initiative was established in a setting of major policy review within the OMNR. As PAC's strategy was developed, cross-referencing with other policy initiatives was necessary. As the strategy was completed, the report of the environmental assessment hearing of timber management practices was released.

The high level of concern about Ontario's old growth forests, perhaps most dramatically characterized by the controversies over logging in Temagami, meant the Conservation Strategy was developed under pressure to meet high, and sometimes conflicting expectations. The severe economic recession has meant that industry's concerns over any loss of wood supply were shared by communities concerned about employment loss, and individuals and communities alike have expressed a sense of less financial flexibility, and therefore more anxiety about changing circumstances.



**Goal:** To conserve Ontario's old growth forest ecosystems throughout the province.

In January, 1992, the Minister of Natural Resources asked a group of citizens from across the province to work as a committee to develop a Conservation Strategy for Old Growth Forest Ecosystems in Ontario. The terms of reference for the Policy Advisory Committee's work required broad consideration of issues related to old growth in Ontario, including its biological, social, economic and cultural values; ways to conserve it through protection and management strategies; and available and needed information. The membership of the Committee was broadly reflective of the different perspectives of the people of Ontario, ensuring that different viewpoints were put forward in the Committee's discussions, and that the many challenges in developing the Conservation Strategy were squarely faced. The public, whom PAC engaged in a two-year discussion about the conservation of old growth forests, demonstrated a high level of interest and their understanding of the issues commanded respect. The diversity of views and values held by the public demanded careful consideration by PAC.

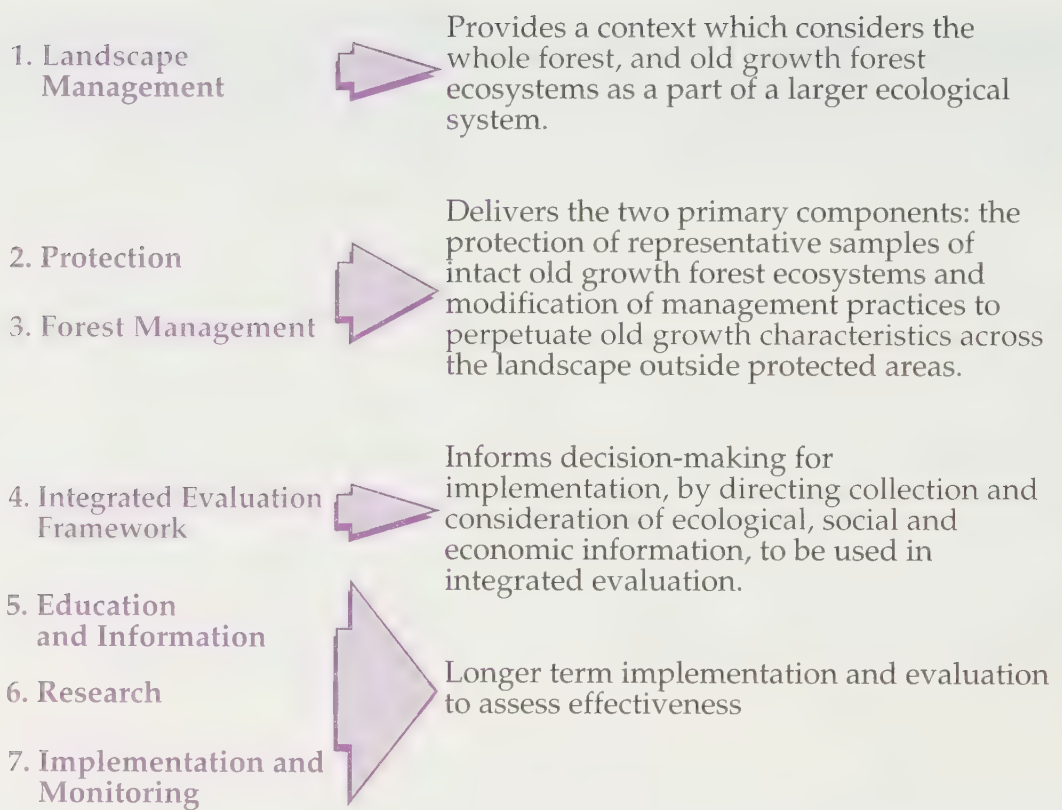
The people of Ontario are concerned about the old growth forest ecosystems, and most particularly about those whose presence is greatly diminished, or whose ability to regenerate is impaired. While all species associations are important, management priority should be given to those species which are most rare and most threatened, such as the remaining portions of the Carolinian, or the red and white pine of the Great Lakes-St. Lawrence. Other Great Lakes species of concern may include hemlock and yellow birch. In the Boreal, an opportunity remains that has been lost in most other parts of the province — to retain large undisturbed ecosystems. Lessons learned through lost opportunities further south and the dynamics of the boreal forest which exist today make that opportunity an attractive one.

Action must be taken now to complete the network of protected areas for Ontario, with old growth forest ecosystems given priority in the establishment of new areas. On land outside protected areas, management practices should emphasize the retention of old growth characteristics to maintain the important structural and habitat features.

The Conservation Strategy developed by PAC provides a sound basis for government and individual action to conserve old growth forest ecosystems on public and private land. The Strategy is organized into seven areas for action, but — like an old growth forest ecosystem — its different components are interactive and interdependent and should be considered and implemented as an entire approach, rather than isolated actions or recommendations. The seven areas for action are:







Each component is essential to the Conservation Strategy's effectiveness. The Strategy itself is essential to the overall health of the forests, and to the future of old growth forest ecosystems in Ontario.

This Strategy has been developed at the request of the Minister of Natural Resources, and OMNR must play a lead role in its implementation. While the recommendations offered are written in the imperative, they are in fact provided as advice to the Minister as the result of more than two years of work on his behalf for the benefit of the forests and people of Ontario. The Ministry is asked to carry out all recommendations in the Strategy by exercising the full extent of its jurisdiction. It will be necessary to work with other Ontario government ministries such as Municipal Affairs, Agriculture and Food, and Northern Development and Mines, and with First Nations governments.

The Strategy recommendations are also offered directly to other jurisdictions, such as private land trusts and First Nations governments. For example, the Wendaban Stewardship Authority, a shared stewardship body appointed jointly by the governments of Ontario and the Teme-Augama Anishnabai, has adopted in principle the recommendations of the "Interim Report on Conserving Old Growth Red and White Pine in Ontario," and has incorporated many of the Interim Report recommendations into its forest management plan.<sup>1</sup>



## Recommendations

### 1. Landscape Management

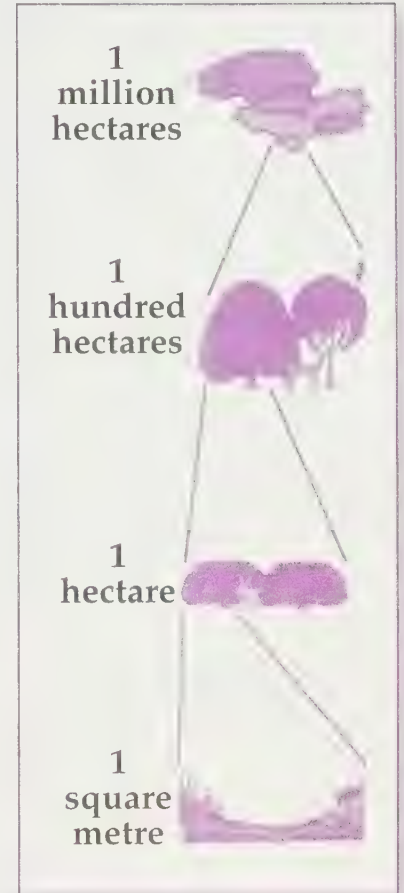
**Objective:** To provide an ecological context for the conservation of old growth forest ecosystems by planning for their presence in relation to the entire forest.

Old growth forest ecosystems do not exist in isolation from the rest of the forest landscape. They are unique components of a dynamic and changing forest. As in any living system, forest components are inter-related and interdependent. Forest health depends on all components of the forest being able to function and contribute to the overall forest system. But to maintain the natural diversity of the forest, decisions about forest management and land use must be made with consideration of how each decision affects the forest at a landscape level.

By managing at a landscape level, we can consider rarity, the effect of adjacent uses, the overall presence or absence of certain values or characteristics and how those values are affected by change. By planning at a landscape level we can accommodate both protection and sustainable use with due regard for how they affect each other without undue conflict or displacement.

In taking this ecosystem approach, planning for land uses at a landscape level expands the traditional bounds of planning. It requires that the boundaries be biophysical, and that the effect of existing and potential land uses on the health of the ecosystems and the ecosystem values over time be considered.<sup>2</sup> Like landscape ecology, a landscape level approach to forest management involves a marriage of biology and geography and requires a comprehensive view of the land, with a reliance on a variety of scientific disciplines and a respect for the range of values present.<sup>3</sup>

In a Conservation Strategy for Old Growth Forest Ecosystems, taking a landscape level approach means that planning and resource decision-making are undertaken in the context of the entire landscape, as opposed to planning for discrete parcels of land. Decisions to allocate old growth forest ecosystems for protection or sustainable use are made in the context of the whole forest. Similarly, management decisions about younger-aged or already disturbed ecosystems are made with some consideration for the old growth systems and for how the long-term presence of old growth will be affected by the results of the decision.



**1.1 Manage forest lands at a landscape level. The old growth component of a landscape approach should include the protection of old growth forest ecosystems and the perpetuation of old growth characteristics in the production forest, so that old growth forest ecosystem function and features are present across the forest landscape.**

By making management decisions at a landscape level, the two tracks of conservation — protection and sustainable use — are most effectively provided. A landscape approach which includes protection and sustainable use meets the goal of conserving Ontario's old growth forest ecosystems by protecting representative ecosystems and perpetuating old growth forest features across the landscape. With the landscape approach, the Conservation Strategy outlines a program for the protection of representative areas of old growth forest ecosystems, and a management approach to perpetuate old growth forest characteristics and function throughout the production forest.

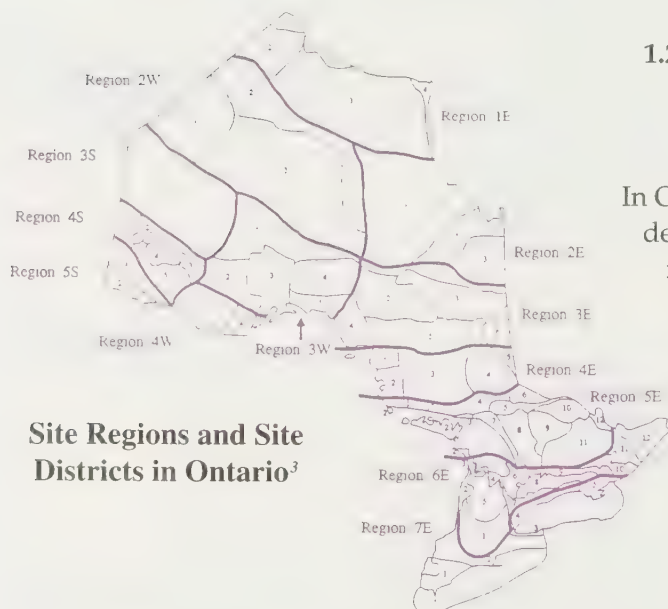
**1.2 Implement landscape management at the site district level, recognizing the need to plan on larger and smaller scales.**

In Ontario, the present planning context for most decisions is an administrative one, based on administrative districts or regions which were established for reasons of a historical or jurisdictional nature rather than ecological. But in making decisions about natural resources, the most reasonable boundaries are natural; natural boundaries will, in turn, establish the appropriate scale for land use planning.

Ontario's three forest regions are divided into 13 site regions, based largely on climate, and into a subset of 65 site districts, based on

topography, soil, and plant communities. Each site district is further defined by recurring vegetation and landform patterns. These patterns, and the communities and species they support, constitute the forest ecological systems.<sup>4</sup> OMNR divides the province into four administrative regions, which do not correspond with the site regions, but since a Ministry reorganization in the early 1990s, are roughly approximate to the forest regions, with the Boreal divided into "northeast" and "northwest".

Depending on the specific subject of the decision or plan, the ecological scale varies from site-specific to global consideration. For the most part, however, the appropriate scale for land use planning and resource management decision-making is the site district, since site districts provide the only consistently defined and used set of ecologically-based boundaries, other than Aboriginal territorial boundaries, which generally follow watersheds.



**Site Regions and Site Districts in Ontario<sup>3</sup>**





### **1.3 Include, in the OMNR program to develop and maintain an integrated information system:**

- **identification and mapping of old growth forest ecosystems, using the old growth indices developed for each species association;**
- **reports summarizing the results of an analysis of existing old growth reserves, identifying representation of typical, rare and rapidly decreasing old growth forest types.**

In its Interim Report, PAC recommended that an integrated information system should be developed which is compatible with existing resource data bases, such as the Forest Resources Inventory (FRI) and the Ecological Land Classification (ELC) systems and which incorporates completed ELC/Forest Ecosystem Classification (FEC) systems for the whole Province, and which is compatible with the Geographic Information System (GIS) and is functional at the field level. The integrated information system should be flexible enough to accommodate additional resource information that could be collected at the field level or by other agencies, and should be able to incorporate a completed, computerized FRI.

An integrated information system, which PAC had proposed in its Interim Report, should include the identification and mapping of old growth forest ecosystems, using the old growth indices developed for each species association. The information system should be able to produce reports summarizing the results of an analysis of existing old growth protected areas, identifying representation of typical, rare and rapidly decreasing old growth forest types.

The development of the integrated information system is essential, and is important to the implementation of the Old Growth Conservation Strategy. Many of the management recommendations will be less effective without this information base. Long-term monitoring and adaptation of management practices will be ineffective without it.

### **1.4 Maintain the diversity of ecological communities, ecosystems and wildlife species by sustaining the current forest species composition and age class structure as a minimum standard.**

As a minimum, the biodiversity of Ontario's forests must be maintained at the current level to provide the essential elements of a healthy forest. A diversity of ages and species is necessary for a healthy forest. More difficult to define, however, is the optimum - what should we be managing the forest towards, in terms of its age class structure, species composition, and overall diversity?

Defining the benchmark forest, or "desired forest," has been a recurring challenge. A benchmark is needed to address questions of distribution and composition, to define disturbance, establish objectives for protection and forest management, and describe forest values across the landscape. A definition of the benchmark forest must assume two things: the forest has been affected by settlement and development over the last two





*Ladyslipper orchids are part of Ontario's natural diversity.*

centuries, and there is a standard of health for the forest condition which can be set by estimating what the forest condition would be today in the absence of those effects.

In *Diversity*, the Forest Policy Panel described maintenance of current biodiversity as a strategic objective for forest sustainability. The report also discussed the worldwide concern that the variety of plants and animals has been dramatically reduced, their genetic make-up altered, or their community structure degraded.<sup>5</sup> An earlier Sustainable Forests Initiative, the Independent Forest Audit, identified large-scale species conversion, primarily from conifers to deciduous and from older to younger ages, in the areas studied in the Boreal Forest Region in Ontario. The Audit also identified a preponderance of forest stands in the oldest and youngest age classes in the Boreal, with a large gap in the middle-age classes.<sup>6</sup> The forest has been, and is being, altered in its species composition and age class structure.

The benchmark forest can be described in many ways: as the pre-settlement forest, the naturally occurring forest, the natural forest, and, less concisely, "the forest that would have been here had we not been here in the way that we are." Whatever the words, the natural forest serves as the benchmark by which we must study, monitor and plan for resource management and as

a standard for the optimum in setting objectives for forest management, such as age class distribution and species composition.

### **1.5 Reassess fire as a management tool to maintain natural forest processes.**

The suppression of fire has had a major effect on the age class distribution of some species, and the regenerative success of others. Prior to fire suppression all but pockets of Boreal species frequently burned, resulting in even-aged stands in a mixed age forest. For some conifers, such as red and white pine, fire has an important role in regeneration. The heat can cause cones to open, encouraging seed dispersal, but fire also removes competition from other species which are not as resilient to fire, and so creates openings for pine regeneration.

In the protected forest, fire suppression often means that the forest's development is unnaturally affected, simply by the removal of this influence. Caution is required and uncertainties exist, as fuel loads are likely to be unnaturally high if fire suppression has been effective. However, reintroducing fire through prescribed or controlled burning could provide a means to remedy the influence of 70 years of fire suppression. In the protected forest, OMNR should consider when and how fire can be allowed to resume its role as a natural disturbance mechanism.



In the production forest, controlled or prescribed burning could have a similarly positive effect. In the production forest, OMNR should use fire as a tool to mimic natural disturbance processes more closely, particularly when developing the regeneration strategy in the silvicultural prescription.

**1.6 Conduct land use planning province-wide and from a legislated basis, ensuring that it is clearly understandable and accessible and effectively provides for public input, review and appeal.**

Decisions using a landscape level approach should be made in an informed manner which considers all potential land uses, values and pressures in the context of the overall landscape. Implementing a landscape management approach means that all potential uses of the land will receive consideration and that a process for reviewing decisions is clear, with some certainty about land use decisions once they are made.

Certain ingredients are essential to a successful process. It must be clear how the decisions get made, who makes the decisions and who is accountable for them. The process must be fair, informed, and accessible to the public. And there must be equity among those participating in the process, in terms of their ability to receive information and participate in the discussions and the decision-making.

Land use plans should be developed at the site district level, and should replace the District Land Use Guidelines and Strategic Land Use Guidelines. OMNR is currently engaged in a review of land use planning processes. To successfully include the Old Growth Conservation Strategy, the planning review should develop a clear process for land use plans to be developed at a site district level, and establish requirements as to how that process will work. The process should include a legislated framework for reviewing proposed changes to land use after the plan has been completed, allowing any proposed change to be reviewed within an understood process.

**1.7 Use the following definition for the identification of old growth forest ecosystems in implementing a landscape management approach and in land use decision-making and planning:**

*"Old growth forest ecosystems are characterized by the presence of old trees and their associated plants, animals and ecological processes. They show little or no evidence of human disturbance."*

In its "Interim Report on the Conservation of Old Growth Red and White Pine Forest Ecosystems," PAC defined old growth forests as *"ecosystems which are characterized by the presence of older trees and their associated plants, animals and ecological processes. They are reflective of the pre-settlement forest."*

For this, its final report, PAC has amended the definition by replacing "reflective of the pre-settlement forests" with the description that old growth forest ecosystems "show little or no evidence of human disturbance."





The Committee sees similar intentions in the two descriptions, in that both relate to the level of human disturbance in old growth forest ecosystems. However, in the year since submitting its Interim Report, PAC has received considerable comment and noted some confusion over the term “pre-settlement forest.” Some felt “reflective of the pre-settlement forest” did not speak directly enough to the issue of human disturbance, and there was uncertainty expressed as to how the term “pre-settlement” should be defined, and whether it was a general description of the natural forest or was meant to identify a certain point in time.

Although an old growth forest ecosystem may show little or no evidence of human disturbance, one should not necessarily conclude there was an absence of human activity. What is meant is that the human presence and activity would have no lasting or discernible effect. For example, many Aboriginal uses, both contemporary and historic, such as trapping, hunting or food gathering, would leave little evidence of human disturbance. While the ecosystem would have been impacted by that human presence, it need not have been materially altered by it. Even Aboriginal agriculture, such as corn growing by the Huron people, is not comparable to European and contemporary agriculture, since the Aboriginal agricultural clearings were pockets of clearings in a sea of forests, with the overall composition and genetic, species and structural diversity relatively unimpaired. By contrast, in southern Ontario today there are small pockets of forest in a sea of industrial, agricultural and urban development, with the overall composition of the forest severely altered. In this condition, the remnant forest is vulnerable to the invasion of non-native species.

The phrase in the definition “*shows little or no evidence of human disturbance*” is somewhat flexible — there may be different judgments as to whether human disturbance is evident or not, and to what degree. The definition provides the first concrete step to identification. It will serve provincially, and will be refined to identify different forest types and areas through the development and use of old growth indices.

- 1.8 Develop a set of indices for the identification, evaluation and monitoring of old growth forest ecosystems across Ontario. The indices should be developed at a site region level, for use in the site districts, and should be developed for each of the species associations identified in the chart of the Species Associations of Ontario. (See Appendix I). The indices should include age, area, disturbance, species diversity, structural diversity and rarity.**

The old growth indices will be used to identify, evaluate and monitor old growth sites — a way by which some measure of “old growthness” can be achieved. While the definition of old growth forests provides very broad provincial identification, the indices will make that definition operational. An index must be developed for each species association at the site region level, with the various criteria or measures being developed specific to that species association in that particular region.

The indices will be used to assess the overall “old growthness” of an identified area, but an inability to satisfactorily meet any one criterion would not necessarily result in dismissing the site as a candidate area for protection or modified management. Each



## Criteria for Old Growth Indices

<b>AGE</b>	ranges from minimum age for identifying potential old growth to maximum age of dominant tree, as in the chart of the Species Associations of Ontario
<b>AREA</b>	size, shape and relative location sufficient to maintain ecosystem function, habitat requirements and genetic diversity
<b>DISTURBANCE</b>	evidence of human disturbance includes roads; mine sites; signs of timber harvest such as stumps, skid trails; signs of agricultural use such as fences, rock piles; hydro-electric development; ecosystem degradation, such as presence of non-native species
<b>SPECIES DIVERSITY</b>	the variety of indigenous plants, animals and other organisms
<b>STRUCTURAL DIVERSITY</b>	presence of standing dead other plants, fallen trees and a multi-layered canopy
<b>RARITY</b>	presence of old growth dependent, rare, threatened or endangered species.

criterion should be assessed, and then viewed in conjunction with the assessment of the other criteria, to arrive at a sum evaluation. The overall assessment will be the directing force, rather than any single item. For example, if an evaluation is being done of two areas, one smaller with no evidence of disturbance, and a second larger with minimal evidence of disturbance, the indices would provide a mechanism to give overall weighting to the various criteria, and require consideration of a number of criteria relative to each other.

Indices should be developed for each of the species associations in Ontario. PAC has developed a table of species associations (Appendix I) which provides the starting point and some general direction for the development of the indices. It is a synopsis of infor-



mation from the Forests Ecosystem Classifications across Ontario and silviculture textbooks, with contributions from OMNR science and technology staff and the Old Growth Initiative's Scientific Advisory Committee and Resource Managers Network. The table provides base information about the major species associations of Ontario. Given that the table was developed provincially, much of the information is more general than would be appropriate at the regional level. For example, the age of maturity or maximum age will vary by site, but a provincial average is provided in the table. Similarly, site descriptions and vegetation communities are described generally, but there will be exceptions in the field.

The indices should be developed at a regional level, with the involvement of resource managers and the public, for each of the species associations, using the table as the first source of information in developing the identification criteria.

The indices will provide a means by which to compare one same-species site to another within the site region. For the indices to be useful in comparing sites from different regions, they would have to be developed with a combination of regional detail and overall consistency. Subsequent planning decisions should result in some of each of the species associations being present in the old growth phase of both the production and protected forests.

## 2. Protection

**Objective:** To protect representative old growth forest ecosystems across Ontario.

A part of Ontario's natural heritage, old growth forests are a feature perhaps most at risk of disappearing from Ontario's forest landscape. The challenge of conserving natural heritage is worldwide. For its part, Ontario has made a commitment to complete the province's system of parks and protected areas by the year 2000. Nationally and internationally, Canada made a commitment to conservation by signing the United Nations Convention on Biological Diversity at the Earth Summit in Brazil in 1992.<sup>7</sup>

Protection is a major component of the Conservation Strategy, and PAC defines protection as *"leaving a natural area in its natural state where management for ecological objectives, but not for consumptive use, may be allowed."*<sup>8</sup>

In protected areas, natural processes are often allowed to continue and the forest can change and evolve with minimal human disturbance or disruption. Old growth forest ecosystems provide important baseline information about how the forest works and act as necessary control areas which allow study and comparison with areas of resource extraction. These ecosystems are increasingly important in light of global concerns such as climate change and loss of wilderness and wildlife and plant species.

Protected areas provide a range of benefits: ecological, educational, scientific, economic, cultural and spiritual. They maintain essential ecological processes and permit the





continued evolution of wild species. They also preserve the genetic diversity that is the source of potential new foods, medicines and other products. Protected areas also provide habitat which may not be available in surrounding areas. They provide environmental services for a broader area, such as the production of oxygen, the creation and protection of soils, the absorption and breakdown of pollutants, and the ameliorization of local and global climates.

Protected areas are natural laboratories to gather and assess information on ecosystem function, and they serve as benchmarks against which to measure changes caused by humans or nature. They promote a deeper understanding of the relationship between humanity and the ecosphere and help build public support for habitat protection. Protected areas give support to cultural identity and heritage values which are linked to wilderness, and they embody the spiritual values of Aboriginal people, as well as ensuring the survival of species which symbolize the province and nation, such as moose and white pine. Protected areas also play a key role in helping diversify local and regional economies through non-consumptive tourism linked to wilderness areas, and other forms of non-consumptive recreation.<sup>9</sup>

Natural areas can be protected through different mechanisms, although the only mechanism in Ontario with a legal basis is the parks system, including provincial and national parks. Other jurisdictions have Ecological Reserves Acts, and in Ontario, some protection is intended through the designation of ANSIs, although they have no legal basis.

Protection in Ontario's provincial parks program generally means that an area is kept free from the disturbance of logging, mining and hydro-electric development, although higher levels of protection can also exclude other potentially disruptive activities, such as motor boats, snowmobiles, fishing, and hunting. Ontario's parks system has five classes of parks, each with a set of activities which are allowed or excluded. Some areas classified as parks do allow industrial disturbance, such as logging in Algonquin Park. The Keep It Wild Campaign<sup>10</sup> has initiated a public discussion of a new category of protected areas for public lands called Conservation Reserves. These reserves would have a management plan to determine which uses (with the exception of mining, logging, hydro-electric development and other industrial activities) would be allowed. Another result of the Keep It Wild Campaign will be consideration of an Ecological Reserves Act in Ontario.

Management for ecological objectives should be considered in some protected areas. Ecological objectives could mean using remedial measures to remove unintended human disturbance, such as non-native plants, or to respond to a previous human influence, such as fire suppression. A management plan would need to consider the effects of human use in protected areas, such as seed transfer and the introduction of



*Downed logs in an old growth forest provide a place for many small plants and animals to live.*



non-native plants along walking trails, and to establish means to control or limit the adverse effects, particularly in sensitive areas.

For many species in Ontario, the opportunity to protect old growth forest ecosystems is almost gone. In the Deciduous Forest Region of southern Ontario, less than three per cent of the landscape remains under forest cover in some counties. In the Great Lakes-St. Lawrence Forest Region, red and white pine have been diminished as a species from approximately 40 per cent of the forest cover to less than three per cent. In the Boreal Region, both the forests and the threats to their integrity are different than in the southern regions. These threats include widespread fire suppression and the industrial conversion of one species type to another. In combination, these two influences have radically altered the composition of the forest. Across Ontario, the need to protect representative old growth forest ecosystems is urgent.

- 2.1 Establish protected areas on Crown lands on a site district basis, providing ecological representation of old growth forest ecosystems. The protection program should be delivered through the Keep It Wild campaign and should include a survey in existing provincial parks to determine the presence of old growth forest ecosystems.**

*Old growth forests are a touchstone to past forests, the zenith of today's forests, and the biological legacy of future forests.*

Herb Hammond "Seeing the Forest Among the Trees"

The need for protection of old growth forest ecosystems is clear. Perhaps not as readily apparent is the basis on which protection — in particular, the level of protection and size of protected areas — should be established. Two alternatives in determining the amount of protection to be achieved were considered: protection of repre-

sentative old growth species associations on a site district basis; and protection based on a land area percentage target, established provincially or regionally.

Protection on the basis of representation by site district would require that the need for protection be established and met at the site district level. It would be based on a set of ecological criteria, i.e. that each species association be represented, that the size be sufficient to maintain ecosystem function, and that the variety and diversity of the site district be reflected. The advantage of this approach is that biological requirements would drive the decisions.

The percentage-based approach to setting protection targets, by contrast, would be much easier to measure success if the objective had been met. However, no clear basis exists for establishing the percentage-based target. Given the great diversity of Ontario's forest regions, it would seem almost impossible to set a provincial percentage-based target which rests on sound science and ecological understanding.

One of the questions raised by adopting the approach of ecological representation by site district is that of how rarity is considered. For instance, a site which has the northernmost occurrence of a species might warrant protection, not because it is representative,



but because it is atypical or unique. Similarly, a species association which has been seriously depleted through development or timber harvesting may no longer be representative in the sense that it is typical of the site district, but it will have assumed an even greater significance because it is rare.

The Keep It Wild campaign seeks to protect the full range of variety that has evolved among the living organisms and ecological systems of which they are part, thus ensuring that both unique and more typical sites would be protected, resulting in representation of both.<sup>11</sup> The protection component of the Conservation Strategy for Old Growth Forest Ecosystems should be delivered through the Keep It Wild Campaign, OMNR's primary delivery vehicle for protecting natural areas. The protection of old growth forest ecosystems should be a priority in its designation of new protected areas.

**2.2 Encourage the protection of old growth forest ecosystems on private land by funding private land stewardship and by providing financial incentives.**  
**OMNR should:**

- support the Natural Heritage League Private Land Stewardship Program, and expand this program across Ontario;
- continue to fully fund the Conservation Land Tax Rebate Program for private and conservation authority lands and recognize old growth forest ecosystems as eligible areas;
- encourage the Federal Minister of Finance to change the tax rules that currently penalize landowners who donate land to conservation organizations or land trusts.

The Ministry is in a position to provide or influence the provision of financial incentives to landowners for protecting old growth forest ecosystems. In addition to encouraging their protection by providing technical assistance and information about old growth, certain financial disincentives to protection should be removed. For example, under the Conservation Land Act, 100 per cent property tax rebates are available for landowners, on the condition that they agree to protect the natural values on their property. While not actually providing an economic benefit, in the sense that harvesting a woodlot would, this rebate program lessens the pressure on landowners to obtain an income from the property. Tax rebate programs should be retained and expanded, while other means of supporting private landowners in making decisions to protect old growth forest ecosystems should be explored and pursued.





**2.3 Evaluate old growth forest ecosystems on private land, and identify old growth forest ecosystems as ANSI's and/or Significant Woodlands. Protection of these sites should occur through adherence to provincial policy statements under the Planning Act.**

OMNR's Keep it Wild Campaign promotes the private stewardship initiatives of the Natural Heritage League and encourages cooperation between OMNR and other government agencies on protection and stewardship of privately owned natural heritage areas.

Areas of Natural and Scientific Interest (ANSIs) identify areas of significant features, but do not protect them. Protection can be achieved through cooperative projects between government and non-government organizations and private citizens. With recent amendments to the Planning Act, as recommended by the Commission on Planning and Development Reform in Ontario,<sup>12</sup> protection can also be provided through municipal planning, which is now required to "have regard" to policy statements issued under the Planning Act, including a policy statement on natural heritage. While OMNR does not have authority over private land, there are numerous means by which ministry staff can provide technical assistance, advice and encouragement which would result in increased levels of protection for old growth forest ecosystems.

### **3. Forest Management**

**Objective:** To perpetuate old growth forest features throughout the production forest, thus contributing to the maintenance of old growth forest ecosystem function and overall ecosystem function across the landscape.

*Healthy forests mean that forest ecosystems are functioning in a natural way, and that human influence is not degrading to any key ecological components or functions over the long term. Healthy forests do not mean all cleaned of all decline and decay. Trees and other organisms die in healthy stands, and stands decline in healthy forests as part of the normal ecological development.*

Diversity

Although protected areas make an important contribution to overall ecosystem and forest health, most forested land is outside protected areas but must still contribute to overall forest health. Continuing the presence of old growth forest ecosystems and their function and features will help to achieve this.

The Ontario Forest Policy Panel laid out principles for sustaining forests, and outlined strategic objectives. A key principle was that large, healthy, diverse and productive forests are essential to the environmental, economic, social and cultural well-being of Ontario, both now and into the future. A key objective: to ensure that the current natural biodiversity of forests is not significantly changed and where necessary and practical, is restored.<sup>13</sup>

Old growth forest ecosystems are an important component of the diverse and healthy



forest. Not only do they provide age class and structural diversity, they also provide genetic variability, habitat for old growth associated species, and a comparison area by which to monitor changes to more manipulated areas of the production forest. Having old growth forest ecosystems and their features and characteristics scattered throughout the landscape will aid in maintaining overall forest function.

Important characteristics of old growth forest ecosystems can be retained through a variety of management techniques. The general approach should be that resource managers aim to maintain old growth ecosystem function by managing for the retention of old growth characteristics and features.

### 3.1 Use appropriate tools to perpetuate old growth features and/or functions throughout the landscape. These tools include:

- extending rotation beyond the normal timber harvest age, in amounts to be established by species association and based on age class distribution, using the naturally occurring forest as the benchmark;
- retaining old growth features by using silviculture prescriptions, including:
  - retaining large live trees
  - retaining snags in various states of decay
  - retaining tree species diversity
  - retaining downed logs in various states of decay
  - girdling live trees to produce snags.

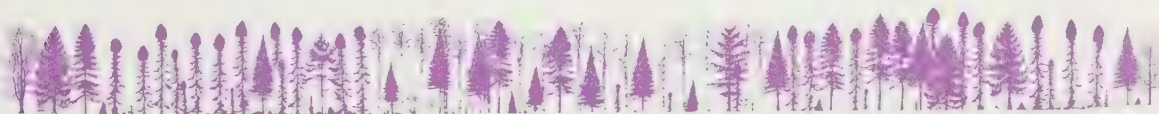
In managing to perpetuate old growth forest features, maintenance of the features throughout the entire forest landscape is key.

Extending the rotation age of stands which could be harvested is one tool to perpetuate old growth features in the production forest. Under an extended rotation regime, some stands would be harvested later than their usual rotation age. Those left would further develop the characteristics of an older aged forest and would provide some of the important qualities of old growth, such as habitat niches and structural diversity. The tool could be applied in a number of different ways, with varied results; the extent to which it would be applied could depend on how much old growth was being maintained by other means.

Another tool to retain old growth features is to develop particular silviculture prescriptions to maintain characteristics such as large live trees, standing dead trees, downed logs on the forest floor or a variety of tree species. The particular prescription would be developed specific to the site and the forest condition, with the overall intent of retaining old growth characteristics during a timber harvest operation.



*Wildlife habitat should be maintained throughout the forest.*



**3.2 On Crown land, require Forest Management Plans to address how old growth forests will be perpetuated. The plan should identify the selected tools, the rationale for the selection, and the expected results.**

Forest management planning is most commonly done through timber management planning. The Timber Management Plan is prepared at field level by resource managers, and organizes the OMNR-regulated activities of harvest, renewal and maintenance of the forests. Objectives, methods and locations of activities for forest resource management are outlined. The Plan is developed for five-year periods, and undergoes a public review process.

As part of the timber management planning process, resource managers outline the intended methods of carrying out the timber management operations, i.e. the harvest and regeneration of allocated areas. While specific prescriptions for normal operations are not required, the development of a set of silvicultural ground rules involves the adaptation of standard methods of acceptable practice, as outlined in documents such as the OMNR silvicultural guides.<sup>14</sup>

To meet the objective of perpetuating old growth forest features across the landscape, resource management plans should clearly describe how old growth forest features will be perpetuated. The plan should describe which tools will be used and discuss why these tools were chosen, how they fulfill the objectives, and what the expected result will be in the field.

**3.3 In administrative districts where no forest management plans are regularly prepared (southern Ontario), prepare plans that describe the management of old growth forest ecosystems. The plan should identify the tools selected to perpetuate old growth characteristics, the rationale for that selection, and the results expected, and should have a process for public review.**

In northern Ontario, 85 per cent of forest lands are Crown land managed by the province, with most resource management and land use planning being done through the timber management planning process. In southern Ontario, 76 per cent of the land is privately owned, with the balance being mostly public land owned by municipalities, park commissions, and conservation authorities. In these cases, the ministry does not control the land, but often manages it through different programs such as Agreement Forests.

In southern Ontario, with less than ten per cent of the forest cover remaining, there are few opportunities left to protect any indigenous forests. By virtue of rarity alone, an urgency exists for the conservation of the last remnants of the old growth forests. That urgency must translate into management practices for the unprotected forest which will ensure the perpetuation of old growth forest characteristics in all instances.





For Crown lands, forest management plans are developed with public review. For Agreement Forests and small crown land parcels in the south, plans are not required and the public has not been regularly involved. The development of plans for the management of old growth forest ecosystems, with a public review process, would help rectify that absence of public input.

**3.4 Ensure, on private land, that landowners are encouraged to manage their forests to perpetuate old growth forests features and/or functions.**

On private land, resource managers working for the Ministry of Natural Resources have no authority to require landowners to manage their forest or woodlot for any particular objective. Rather, ministry staff assist the landowner through advice, technical expertise, and tree marking. Staff do, however, work within the general framework of the ministry, meeting its overall objectives. Given the objective of conserving old growth forest ecosystems throughout the province, OMNR staff working with landowners should encourage the perpetuation of old growth through education and silviculture programs, and when assisting landowners to develop management plans.

**3.5 Ensure the practical implementation of management practices which perpetuate old growth forest features and/or functions by:**

- amending silvicultural and forest management guidelines used by the OMNR field staff, to include the use of these management practices;
- including management practices to perpetuate old growth forest characteristics in OMNR staff training;
- including management practices to perpetuate old growth forest characteristics in their Demonstration Forest program (forested areas where silvicultural practices are tested).



*Forest management practices should encourage natural regeneration.*

The perpetuation of old growth forest ecosystem characteristics through modified management practices should be integrated into the ministry's operating and management standards, and so into resource management, through a number of different mechanisms, including amendment of the guidelines used by field staff, incorporation into the field staff



training and inclusion in demonstration projects, such as the Demonstration Forest program.

For medium and long-term success in achieving old growth objectives in Ontario, changes in management approaches must be integrated into the mainstream of the ministry's way of doing business — creating a new corporate norm, which is in keeping with the new forest culture described by the Forest Policy Panel.<sup>15</sup>

#### *4. Integrated Evaluation Framework*

**Objective:** To make resource management decisions in a fair and informed manner, fully considering the appropriate ecological, social, cultural and economic factors.

Part of PAC's mandate is to describe the biological, social, cultural and economic values associated with old growth. The Committee has accepted that, with the opportunity to develop a Conservation Strategy, comes the responsibility of ensuring that, as well as the environmental imperative, social and economic realities are considered. Decisions about resource use and allocation will affect communities, the future of Ontario's forests, and the options that remain open to future generations. These decisions must be made with fairness, understanding and foresight.

In developing the "Interim Report on Old Growth Red and White Pine", the Committee found real inconsistencies in how "socio-economic impact" was defined, in what expectations the term provoked, and in how social and economic analyses were framed and applied. Even information about timber supply and volume estimates was difficult to obtain, and often subject to debate or amendment. While there appears to be general agreement in the public and public service about the importance of doing socio-economic assessments, there appears to be little agreement beyond that. Discussion appears to be even more limited on how linkages are made between ecological evaluation and social and economic analysis. But such linkages are needed if decisions are to be made based on an informed understanding of the variety of values that will be affected by any decision or series of decisions.

How then to proceed in collecting and weighing the information needed in making resource allocation decisions in the implementation of the Conservation Strategy? The first steps have already been taken, in the identification of broadly held old growth values. The next step is the application of a framework for decision-making in resource allocations, which incorporates ecological, social and economic information and concerns.<sup>16</sup>



#### 4.1 Use the integrated evaluation framework developed by the Old Growth Forests Policy Advisory Committee in resource management decision making on all Crown lands.

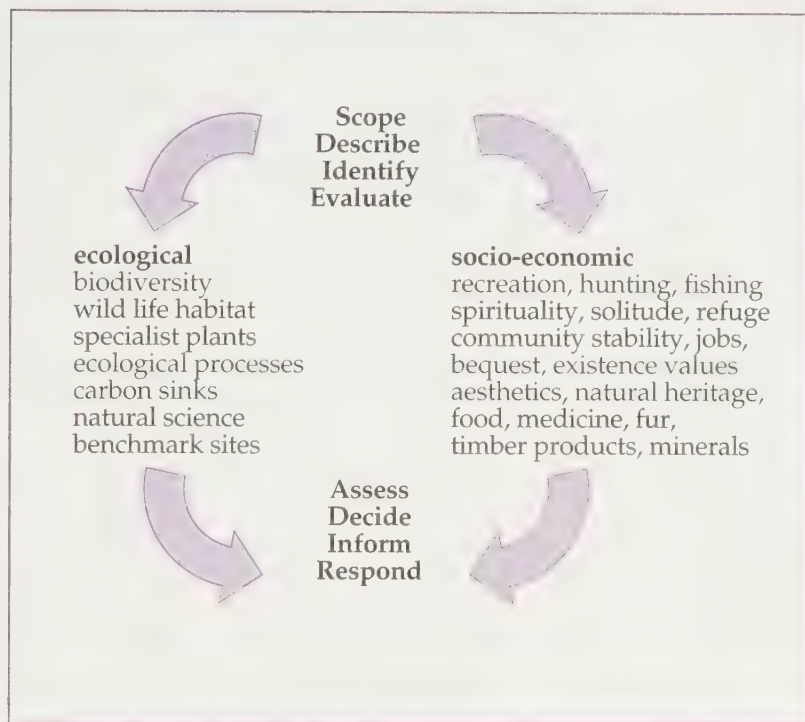
Recognizing both the need for decisions which are informed by a socio-economic analysis and the lack of a policy within the OMNR to support such analyses, the Committee has developed a basic framework for integrated ecological and socio-economic evaluation.

In the Interim Report, PAC recommended that a method be developed to measure old growth values in economic and non-economic terms,<sup>17</sup> and that a model be developed that can be used as a decision-making tool to weigh socio-economic impacts of resource management decisions.<sup>18</sup>

In its second year of work, the Committee examined a number of economic and evaluative models for resource management decision-making and had hoped to identify a model which would serve the Conservation Strategy and its implementation, i.e. a model that would consider ecological and economic and social concerns, and force an integrated approach to evaluation and decision-making.

While PAC was impressed by some tools, and concerned about the deficiencies of others, no single model won PAC's confidence, or seemed to have the confidence of a variety of stakeholders. PAC then began work to develop a framework for socio-economic evaluation, with the assistance of some expert resource people and participants at a multi-stakeholder workshop. What emerged is the Integrated Evaluation Framework.

The framework identifies the values to be considered, outlines an approach to evaluation, and provides a decision-making process and describes roles for stakeholders and First Nations. The framework is one which should be applied in all resource management decision-making, not just in decisions about old growth forest ecosystems. It is being recommended in the context of the Old Growth Conservation Strategy as an illustration of how it could be used, and in order to complete the conservation initiative.





The Strategy assumes an environmental imperative, and the recommendation of a framework for integrated analysis is premised on an understanding that the need for protection of ecologically representative old growth forest ecosystems on a site district basis will be met. The framework serves two purposes: it ensures that a decision, while made on an ecological basis, is accompanied by a sound understanding of the social and economic benefits and costs; and, should there be two areas of equal ability to provide ecological representation, the framework allows social and economic factors to act as a second filter. Further, the integrated framework should not just be applied when the protection option is being considered, but should be used when any resource allocation decision is being made, whether for protection or sustainable use.

While the Conservation Strategy for Old Growth Forest Ecosystems will, for the most part, be implemented at a site district level, a framework for ecological, social and economic evaluation is just that — a framework. As such, it should be equally applicable at different scales, from site-specific to provincial.



# An Integrated Evaluation Framework for Resource Management Decision Making: Considering Ecological, Social and Economic Values

Step	Description	Discussion
SCOPE	<ul style="list-style-type: none"> <li>Establish a process of valid first Nations' values</li> <li>Identify issues, goals, objectives</li> <li>Clarify identified interests</li> <li>Make the process clear and accessible to public</li> <li>Develop a workplan for the evaluation</li> </ul>	<p>Resource management decisions in our area will be made within two policy contexts: a Policy Framework for Vancouver, British Columbia, which considers both the short-term and long-term interests of the community, and a government-to-government relationship. To a certain degree, these broad policy contexts will guide the evaluation process. To a certain degree, these broad policy contexts will guide the evaluation process. To a certain degree, these broad policy contexts will guide the evaluation process.</p> <p>Decisions which affect resource use and allocation will affect communities and individuals and their families, as well as affecting the future of Ontario's natural resources. Decisions which affect resource use and allocation will affect communities and individuals and their families, as well as affecting the future of Ontario's natural resources. Decisions which affect resource use and allocation will affect communities and individuals and their families, as well as affecting the future of Ontario's natural resources.</p>
IDENTIFY	<ul style="list-style-type: none"> <li>Describe base case conditions and assemble existing information about the natural, social and economic resources</li> <li>Identify values and impact factors and indicators</li> <li>Identify role for the public and their participation throughout the process</li> <li>Compile existing data on values and impacts</li> <li>Review preliminary list of impact factors and indicators with public and stakeholders</li> <li>Identify alternative management options</li> <li>Design an evaluation model</li> </ul>	<p>As a first step in describing the base condition of the site, ecological and socio-economic information generated will be assembled, using sources such as timber management plans, water resource studies, wildlife management plans, land use studies, etc. This information will be used to identify the base case conditions. A complete inventory of all available information will be assembled, including aboriginal rights and treaty obligations, and from it a picture of the area's ecological and socio-economic conditions will be drawn, as well as an analysis of the strengths and weaknesses of the techniques should be identified. The public and the decision-makers must understand the model in order to have confidence in the results.</p> <p>The outcome of an evaluation study will be profoundly affected by the selection of impact factors and indicators. The selection will also have an effect on the results of the evaluation study. It is important to tailor the choice of impact factors to the specific needs of each planning application. There are certain criteria that can guide this selection:</p> <ol style="list-style-type: none"> <li>Comprehensiveness - The list of factors will represent the range of social and economic impacts that could reasonably be expected from the policy decision under study</li> <li>Balance - The enumeration and presentation of factors should be descriptive, and not imply anything about the weight or relative significance attached to any individual factor</li> <li>Lack of Redundancy - A policy impact can usually be measured at several levels within an economic or ecological system. If the same factor is counted at more than one level it will be over-represented in the impact analysis and bias the outcome of the analysis</li> <li>Transparency - Factors and indicators will be measured and assessed in a way that is readily understood. Where statistical and computer modelling techniques are used, the analysis should be interpreted in non-technical language. The assumptions, limitations, strengths and weaknesses of the techniques should be identified. The public and the decision-makers must understand the model in order to have confidence in the results.</li> </ol>
ANALYSIS	<ul style="list-style-type: none"> <li>Gather information for the evaluation analysis (field work, interviews, community profiles, etc.)</li> <li>Identify the information collected and its analysis and summarize descriptive impact data</li> <li>Forecast future conditions with and without each management option</li> <li>Document the information collected and its analysis and summarize descriptive impact data</li> <li>Check validity of model, ability to consider the information gathered</li> </ul>	<p>Each of the impact factors will be defined and described, with its particular indicators and area of impact discussed, and with a summary evaluation done of each of the impact factors. The impact factors will be defined and described, with its particular indicators and area of impact discussed, and with a summary evaluation done of each of the impact factors. The impact factors will be defined and described, with its particular indicators and area of impact discussed, and with a summary evaluation done of each of the impact factors.</p>
EVALUATE	<ul style="list-style-type: none"> <li>Assign weighting to impact factors to determine their relative importance</li> <li>Identify trade-offs between alternative management options</li> <li>Search for new options and alternatives, and review those with process participants</li> <li>Refine assessments and reconsider impacts</li> </ul>	<p>To be effective, a methodology is needed to analyze the information and use it to inform the decision which is to be made.</p> <p>Several methods of analyzing the ecological, social and economic values in resource management are available. The Old Growth Strategy in British Columbia adopted "multiple accounts analysis" as their approach. The method incorporates Cost-Benefit Analysis and Multi-Criteria Analysis. The method incorporates Cost-Benefit Analysis and Multi-Criteria Analysis. The method incorporates Cost-Benefit Analysis and Multi-Criteria Analysis.</p>
DECIDE	<ul style="list-style-type: none"> <li>Formulate recommendations for allocation of resources, management strategies and impact mitigation</li> <li>Decide on the management option</li> </ul>	<p>It must be clearly identified what decision-making structure is in place, at which level in the OMSR, and what information is needed to be made, and by whom the decisions will be made.</p>
IMPLEMENT	<ul style="list-style-type: none"> <li>Inform the public of the decision, its rationale, and the schedule for its implementation</li> </ul>	<p>To maintain public involvement, interest and confidence in resource management, decisions must be made in an informed manner, and be clearly conveyed to the public and affected communities, and then implemented in a public, and consistent fashion.</p>
REVIEW	<ul style="list-style-type: none"> <li>Use information collected in the evaluation to respond to effects of the decision</li> <li>Review other government initiatives and industrial and social strategies pertaining to the area of a decision, and assess the effectiveness of the decision in response to the public and the decision-making process</li> <li>Review the impact of the decision on the environment and the public, and the decision-making process</li> </ul>	<p>When management decisions have been made, and the site is allocated to a resource use, the impact of the decision on the environment and the public must be monitored, and the decision adjusted if needed, and the impact of the decision on the environment and the public must be monitored, and the decision adjusted if needed, and the impact of the decision on the environment and the public must be monitored, and the decision adjusted if needed.</p>

#### 4.2 Involve the public in implementing the Conservation Strategy for Old Growth Ecosystems at the site district level by engaging the public when making resource management decisions.

PAC is recommending a Conservation Strategy which is based on consultation with the public, advisory groups of natural and social scientists and resource managers, and on two years of research and consideration by the Committee. However, the Strategy being recommended is a policy which is provincial in scope, and many field-level decisions are yet to be made. These decisions will be made in the course of the Conservation Strategy's implementation at the site district scale.

In the implementation of the Conservation Strategy, OMNR should engage the public in decision-making, including the development of the old growth indices and the application of the integrated evaluation framework. The public should be involved in collecting and assessing ecological, social, cultural and economic information, and in ensuring that the information is reasonably considered.

## 5. *Research*

**Objective:** To promote increased knowledge and understanding of old growth forest ecosystems, and their ecological function and role in Ontario's forests.

5.1 Develop and implement a 10-year research program to further the public and scientific understanding of old growth forest ecosystems, their function, and their presence and relationship to the younger forests over time and space. The research program could include research on:

- the structure and function of old growth forest ecosystems;
- the status, degree and nature of the dependence of organisms that are closely associated with old growth forests in Ontario;
- fire and its role in maintaining natural processes;
- the effect of human disturbance on old growth forest ecosystems;
- economic and social factors and processes associated with old growth forests, including non-monetary benefits, or non-timber supply related economic benefits.

In its consultation, the public made it clear to PAC that more information about old growth forests must be made available. The public also wants the people who develop policies and make decisions to know more about the forest ecosystems.

Research into old growth forest ecosystems is relatively new. Scientific understanding is still limited in many respects, leaving unanswered questions. As we continue to learn about these ecosystems, knowledge will grow over time, through continuing research





and observation. The recommended 10-year research program will add to the body of scientific information and provide a reasonable planning horizon to allow initial monitoring of function and ecosystem changes.

More knowledge of old growth forests is needed if we are to judge the effectiveness of measures taken to retain old growth across the landscape, and to assess the objectives of the Conservation Strategy a decade from now.

**5.2 Establish a scientific research planning committee which could include members from academic institutions, the federal and provincial governments, industry, and non-governmental organizations. The research committee should:**

- **identify ongoing and new research needs;**
- **identify opportunities for cooperation among agencies;**
- **identify means of communicating research findings among agencies and to the public.**

With limited research funding available, it is essential that the best value be gained for the research dollars spent. Value is best achieved in an atmosphere of open communication and cooperation among the various research bodies. While there is a growing wealth of knowledge, much is still to be learned and a forum is needed for the cross-fertilization of research ideas and findings.

With increasing public concern and involvement in resource management, the public needs immediate and improved access to research findings and scientific information as it becomes available. Such access will increase the effectiveness of the public's role in land use planning, and will mean better use of the funding dollars spent, due to the increased usefulness of the research outputs.

A research committee that includes members of academic institutions, the federal and provincial governments, industry, and non-governmental organizations will facilitate the use of each other's communication channels, resulting in access to a broader audience for research organizations releasing their conclusions, again resulting in better value for scarce research dollars.

*"If public input is to be meaningful, the people involved must have access to information that is clearly understandable. If people who are to be affected by resource management decisions are to have a say, they must be presented with all the options. These must be explained in a coherent, non-technical manner so as to enable people to be active citizen-participants rather than passive consumers. "*

*"Direction '90's"*



## 6. *Education and Information*

**Objective:** To increase the public understanding of old growth forest ecosystems and their ecological, social, cultural and economic values.

In the course of its two years of work, PAC became increasingly aware of the wide variations across the province in levels of information and understanding of old growth forest ecosystems, and the social, ecological, and economic issues related to them. With heightened public concern about the state of Ontario's forests, including old growth, and with increasing public involvement in resource management planning, it is essential that the public has access to sound information that will assist in expressing and resolving concerns.

### 6.1 Provide information and education on old growth forest ecosystems by:

- giving technical support and assistance to local governments, conservation authorities, conservation groups and private landowners;
- developing a public awareness program about old growth forest ecosystems;
- producing a supplement to the Focus on Forests manual-based program used by elementary and secondary schools and community groups;
- establishing partnerships with Ontario universities and colleges, industry, government and non-government organizations and other associations.

Just as changes in management approaches must be integrated into the operation of OMNR to achieve old growth objectives in Ontario, so too must understanding and information about old growth forest ecosystems be made readily available to the general public. Information about old growth forest ecosystems should be integrated into OMNR information and education packages.

Old growth forests generate a keen interest in the public, as evidenced and expressed over the course of the Committee's community meetings.<sup>19</sup> This is an interest which must be fed as the scientific understanding of old growth ecosystems continues to develop and as the social and ecological values of old growth forests are better recognized and articulated as part of Ontario's new forest culture.



and observation. The recommended 10-year research program will add to the body of scientific information and provide a reasonable planning horizon to allow initial monitoring of function and ecosystem changes.

More knowledge of old growth forests is needed if we are to judge the effectiveness of measures taken to retain old growth across the landscape, and to assess the objectives of the Conservation Strategy a decade from now.

**5.2 Establish a scientific research planning committee which could include members from academic institutions, the federal and provincial governments, industry, and non-governmental organizations. The research committee should:**

- **identify ongoing and new research needs;**
- **identify opportunities for cooperation among agencies;**
- **identify means of communicating research findings among agencies and to the public.**

With limited research funding available, it is essential that the best value be gained for the research dollars spent. Value is best achieved in an atmosphere of open communication and cooperation among the various research bodies. While there is a growing wealth of knowledge, much is still to be learned and a forum is needed for the cross-fertilization of research ideas and findings.

With increasing public concern and involvement in resource management, the public needs immediate and improved access to research findings and scientific information as it becomes available. Such access will increase the effectiveness of the public's role in land use planning, and will mean better use of the funding dollars spent, due to the increased usefulness of the research outputs.

A research committee that includes members of academic institutions, the federal and provincial governments, industry, and non-governmental organizations will facilitate the use of each other's communication channels, resulting in access to a broader audience for research organizations releasing their conclusions, again resulting in better value for scarce research dollars.

*"If public input is to be meaningful, the people involved must have access to information that is clearly understandable. If people who are to be affected by resource management decisions are to have a say, they must be presented with all the options. These must be explained in a coherent, non-technical manner so as to enable people to be active citizen-participants rather than passive consumers. "*

*"Direction '90's"*





To effectively manage, we must consistently monitor, evaluate and adapt our management approaches over time and across the landscape. This requires consistent standards of data collection and measurement. PAC's recommendation in the Interim Report focused on an audit program;<sup>21</sup> the program should be expanded to be consistent with the Forest Policy Panel's recommended Adaptive Ecosystem Management, and with PAC's Final Report recommendations on effectiveness monitoring.

## **7.2 Prepare and release the Ministry's action plan to implement the "Interim Report on Conserving Old Growth Red and White Pine".**

When the Old Growth Forests Policy Advisory Committee was established in January 1992, its mandate was clear: to develop a conservation strategy for old growth forest ecosystems in two phases, addressing old growth red and white pine in its first year, and all old growth forest ecosystems in its second year. The Committee was also directed, by its terms of reference, to monitor the implementation of its Interim Report and its effectiveness while completing the second phase of its work.

In June 1993, PAC submitted its Interim Report on Conserving Old Growth Red and White Pine to the Minister of Natural Resources, making thirty-two recommendations on information, research, protection, forest management, and restoration.

PAC has been concerned about the lack of an action plan in response to the Interim Report, and that the subsequent lack of action may have cost Ontario rapidly vanishing opportunities to conserve old growth red and white pine.

In a very tangible way, options are being eliminated for the conservation of old growth pine forests with each further delay in implementing the Interim Report recommendations. For example:

- On March 9, 1994 a list of candidate sites for protection, and a public consultation about the sites, was announced with the launching of the "Keep It Wild" Campaign, the OMNR's new protection initiative. No old growth sites were included in the list.
- Most of the ten old growth red and white pine areas identified as candidate protected sites in Site Region 4E continue to be deferred, waiting for the evaluation, as they have been since 1990.
- On April 1, 1994 annual work schedules for 1994/95 cutting operations were approved without a decision on the conservation strategy for old growth red and white pine.
- Many districts across the province are completing timber management plans for the next five years, without the benefit of directions to implement the recommendations of the Interim Report.



- The absence of a response to the Interim Report made it impossible for PAC to identify barriers to its implementation, an important consideration while developing the final report.

PAC has been advised that old growth red and white pine within parks has been identified, and that district staff have mapped old growth areas outside Site Region 4E and that these maps are available for inspection at District Offices, although harvesting has not been specifically deferred from these areas.

PAC has also been informed that some of the ten Iles sites (those within Site District 4E3) are being evaluated for ecological representation (a protection designation was announced for four of the sites on June 30, 1994, and one site no longer meets the criteria, due to timber harvesting).

Some of the research recommendations made are being addressed through the Forest Fragmentation and Biodiversity research program at the Ontario Forest Research Institute, or, in the case of the socio-economic recommendations, through the Ministry's Forest Values project.

There have been positive developments in response to the Interim Report at the field level, even in the absence of an implementation plan. Many field staff are working to incorporate the principles and directions of the Interim Report on Conserving Old Growth Red and White Pine, such as the Fort Frances district, who developed "Strategies for the Management of White Pine" in response to the Interim Report. The Fort Frances report responds to some of PAC's recommendations, and is now being used by Fort Frances District, as well as other districts in the Northwest Region. Field staff in other districts are acting on the recommendations of the Interim Report, although it is impossible for PAC to assess to what degree or with what consistency.

On June 30, 1994, the Minister released a "Conservation Strategy for Old Growth Red and White Pine Forest Ecosystems in Ontario". The two page policy statement included the goal statement "to ensure that red and white pine forest ecosystems, including old growth stands, are present on the landscapes of Ontario now and into the future, while permitting a sustainable harvest of red and white pine". The policy committed the province to protecting "representative ecosystems of old growth red and white pine in each site district in Ontario within the natural range of pine", and set out objectives in forest landscape management: maintaining the red and white pine component at current levels as a minimum; setting specific targets for the restoration of red and white pine; establishing an age class distribution that includes old growth, at the forest management level; developing pre-harvest silvicultural prescriptions, based on specific stand and site conditions, to retain old growth characteristics; and using natural regeneration as the preferred option. The policy statement also identified specific actions which MNR will initiate to assist the forest industry in adjusting to lowered harvest levels which may result.

The Minister also announced two protection designations, for the Ranger North old growth area, near Sault Ste. Marie, a site combining three of the ten deferred Iles sites,



and for a site at Tikamaganda Lake, southeast of Wawa, and indicated further sites would be protected in coming months. In addition, six small old growth sites were designated for protection in northwestern Ontario.

PAC welcomes the Minister's formulation of policy in response to the Interim Report, and is encouraged by the policy statement's incorporation of many of the recommendations made by the Committee. However, PAC's concern over the lack of an action or implementation plan persists. A policy statement is an essential step towards implementation, but it is the implementation of a conservation strategy that will actually conserve old growth forest ecosystems.

PAC is unable to complete the part of its mandate that directs it to "assess the effectiveness of achieving the goals and objectives as stated in the interim strategy", given that the goals and objectives of the Interim Report have not yet been implemented. Instead, PAC encourages the Minister to implement the thirty-two recommendations, and to provide the public with a policy response and action plan without further delay.

**7.3 Immediately develop a policy response and action plan to implement the Conservation Strategy for Old Growth Forest Ecosystems as recommended in this final report. In developing the response and implementation plan, the Minister should :**

- clearly identify the decision-making structure in place for the Strategy's implementation, and identify at which level in OMNR's organizational structure the various decisions and actions for implementation will be taken;
- inform the public of the Government's response and implementation plan without undue delay.





## *Closing Remarks*

The Policy Advisory Committee was established to develop and recommend a Conservation Strategy for Old Growth Forest Ecosystems for the province of Ontario. We believe this report has met that challenge. In saying this, we realize that scientific knowledge of Ontario's old growth forest ecosystems is incomplete. In this report, we recognize progress made in understanding the ecological dynamics of our old growth forests and, in turn, the limits that persist in our efforts to conserve old growth. We encourage the leading scientists and resource managers to continue improving to enlighten us, to explain how our actions today impact on tomorrow's forests. We encourage industry and communities to pursue the long-term benefits of conserving this unique and valuable resource.

This report is the product of more than two years of reading, listening and contemplation by nine volunteer committee members. We have listened to all of the arguments and believe the Conservation Strategy reflects and responds to the wide range of concerns which have been expressed by all who took the opportunity to participate in the process. This report is based on existing scientific and practical knowledge. The recommendations are clear, and a path has been defined.

What is required now is decision and action. Decisions must be made and clearly conveyed to the public, resource managers and forest-based industries and action must be taken to implement the Conservation Strategy, ending uncertainty for forest users and ensuring that options to conserve old growth forests are not lost to inaction and delay.

Time is of the essence. Our future is now.



# Chapter Notes

## Chapter 1

1. Wildman, Honourable C. J. (Bud), Speaking notes for news conference announcing the formation of the Old Growth Forests Policy Advisory Committee, January 28, 1992.
2. Ontario Ministry of Natural Resources, *Direction '90s*, (Toronto: Queen's Printer for Ontario, 1991).
3. World Commission on Environment and Development, *Our Common Future*, (New York: Oxford University Press, 1987).
4. Ontario Forest Policy Panel, *Diversity: Forests, People, Communities - A Comprehensive Forest Policy Framework for Ontario*, (Toronto: Queen's Printer for Ontario, 1993). This report was submitted to the Honourable Howard Hampton on June 28, 1993.
5. Appendix H contains a list and brief descriptions of the Sustainable Forestry Initiatives.
6. Ontario Native Affairs Secretariat, *Statement of Political Relationship*, (Toronto: Ontario Native Affairs Secretariat, 1991). The statement was signed by Ontario Regional Chief Gordon Peters, Chiefs of Ontario; Grand Chief Joe Miskokomon, Union of Ontario Indians; Grand Chief Harry Doxtator, Association of Iroquois and Allied Indians; Grand Chief Bentley Cheechoo, Nishnawbe-Aski Nation; Grand Chief Mike Mitchell, Mohawks of Akwesasne First Nation; Chief William Montour, Six Nations of the Grand River First Nation; Chief Roy McDonald, Islington First Nation; Chief Howard Pamajewon, Shawanaga First Nation; Chief Gary Potts, Teme-Augama Anishnabai First Nation; Chief George St. German, Chippewas of Rama First Nation; Chief Doug Sinoway, Whitesand First Nation; Bob Rae, Premier of Ontario; and C. J. (Bud) Wildman, Ontario Minister Responsible for Native Affairs.
7. Other terms can be found in the Glossary, at the end of this Report.
8. The World Conservation Union, United Nations Environment Programme, and the World Wide Fund for Nature, *Caring for the Earth. A strategy for Sustainable Living*, (Gland, Switzerland: The World Conservation Union / United Nations Environment Programme / The World Wide Fund for Nature, 1991), 210.
9. PAC's terms of reference directed that the Committee monitor implementation of the Interim Report during their second year of work. Comment is provided in the final chapter of the Final Report.



## Chapter 2

1. Rowe, J. S. , *Forest Regions of Canada*. *Department of the Environment, (Canadian Forestry Service, Publication No. 1300, 1972)*; Burns, R. M. and B. H. Honkala, *Silvics of North America Volume 1 and 2*. (Forest Service, United States Department of Agriculture, 1990).
2. Oliver C. D. and B. C. Larsen. *Forest Stand Dynamics*, (New York: McGraw Hill, 1990); West, D. C. , H. H. Shugart and D. B. Botkin. *Forest Succession: Concepts and Applications*,. (Springer Verley, New York, 1981); Shugart H. H. *A Theory of Forest Dynamics*, (Springer Verley, New York, 1986). ; Kimmins, J. P. , *Forest Ecology*, (New York: Macmillan Publishing Company, 1987). ; Society of American Foresters, *The Task Force Report Biological Diversity in Forest Ecosystems*, (SAF-91-03, Bethesda, Maryland, 1991). ; Wickware, G. and C. Rubec, *The Ecosystems of Ontario*, (Environment Canada. Land Classification Services No. 26. 1989).
3. Fritz, P, A. V. Morgan, U. Eicher and J. H. McAndrews, *Stable isotope, fossil coleoptera and pollen stratigraphy in the late Quaternary sediments from Ontario and New York State*, (Palaeography, Palaeoclimatology, Palaeoecology 58: 183-202. 1987). ; Ritchie, J. , *Postglacial Vegetation of Canada*, (Cambridge, U. K. : Cambridge University Press, 1987). ; Terasmae, J. , *A Discussion of Deglaciation and the Boreal Forest History in the Northern Great Lakes Region*, (Proc. Entomological Soc. Ontario. 99:31-43. 1969). ; Day, R. J. , *The Dynamic Nature of Ontario's Forests from Post Glacial Times to the Present Day*, Old Growth Forests Conf. Proc. University of Toronto, (Toronto: Canadian Scholar's Press Ltd. , 1990). ; Liu, K. B. , *Post Glacial Vegetational History of Northern Ontario*. (Ph. D. thesis. University of Toronto, 1982).
4. Brown, D. M. , G. A. McKay and L. J. Chapman, *The Climate of Southern Ontario*. Department of Transport, (Climatological Studies #5, 1968).
5. Chapman, L. J. and D. F. Putnam, *The Physiography of Southern Ontario*, (Toronto: University of Toronto Press, 1951). ; Jones, R. K. , G. Pierpoint, G. M. Wickware, J. K. Jeglum, R. W. Arnup and J. M. Bowles, *Field Guide to Forest Ecosystem Classification for the Clay Belt*, site region 3E, (Agriculture Canada and Ontario Ministry of Natural Resources, Queens Printer, 1983). ; Wickware, G. and C. Rubec, *The Ecosystems of Ontario*, (Environment Canada, Land Classification Services No. 26. 1989).
6. Krause, H. H. and G. F. Weetman and P. A. Arp, *Nutrient Cycling in Boreal Forest Ecosystems of North America*, (Pro. 5th N. Amer. For. Soils. Conf. Col. p387-319, 1980). ; Pritchett, W. L. and R. F. Pritchett, *Properties and Management of Forest Soils*, (New York: John Wiley and Sons, 1987). ;
7. Hills, G. A. , *A Ready Reference to the Description of the Land of Ontario and its Productivity*, (Division of Research, Ontario Department of Land and Forests, 1959). ; Chapman, L. J. and M. K. Thomas, *The Climate of Northern Ontario*, (Department of Transport. Climatological Studies #6, 1968). ; Hare, F. K. and M. K. Thomas, *Climate Canada*, (Toronto: J. Wiley and Sons. 1979).





8. Kimmins, J. P. , *Forest Ecology*, (New York: Macmillan Publishing Company, 1987). ; Larsen, J. A. , *The Boreal Ecosystem*, (New York: Academic Press, 1980).
9. Maser, C. , *The Redesigned Forest*, R&E Miles California, 1988.
10. Day, R. J. and E. M. Harvey, *Forest Dynamics in the Boreal Mixedwood*. In *Boreal Mixedwood Symposium*. (Sym. Proc. O\_P-9 Can. For. Serv. Great Lakes For. Res. Centre, 1981). ; Shugart H. H. , *A Theory of Forest Dynamics*, (Springer Verley, New York, 1986). ; West, D. C. , H. H. Shugart and D. B. Botkin, *Forest Succession: Concepts and Applications*. (Springer Verley. New York, 1981).
11. Ward, P. C. and A. G. Tithecott. *The Impact of Fire Management On the Boreal Landscape Of Ontario*, (Ontario Ministry of Natural Resources, 1993). ; Alexander, M. E. , *Forest Fire History Research in Ontario*, (Fire History Workshop, University of Arizona, Tueson, Arizona, 1980). ; Cwynar, L. C. , *The Recent Fire History of Barron Township, Algonquin Park*, (Can. J. Bot. 55:1526-1538, 1977). ; Woods, G. T. and R. J. Day, *A Fire History Study of Quetico Provincial Park*, (Ontario Ministry of Natural Resources, Report #4, 1977).
12. Environmental Assessment Board, *Class Environmental Assessment of an Undertaking by the Ministry of Natural Resources for the Activity of Timber Management on Crown Lands in Ontario. Statement of Evidence Panel IV: Ontario's Wood Supply*, 1988.
13. Buchert, G. P. , *Genetics of white pine and implications for management and conservation*, (Paper presented at a workshop on red and white pine October 6, 1993 Chalk River, Ontario). ; Jacob, J. , O. L. Lange and J. S. Olsen, *Genetics of Forest Ecosystems*, (Springer Verlag. New York. 1976). ; Ledig, F. T. , *The Conservation of Diversity in Forest Trees*, (Bioscience 38: 471-479, 1988).
14. Canadian Council of Forest Ministers, *Compendium of Canadian Forestry Statistics*, 1993.
15. Forest Industry Action Group, *Hard Choices - Bright Prospects: A Report and Recommendations from Labour, Industry and Government to the Ontario Minister of Natural Resources*, (Ontario Ministry of Natural Resources, Queens Printer, 1993).
16. Forestry Canada, *Selected forestry statistics: Information Report E-X-44, E-X-46*, (Ottawa: Economics and Statistics Directorate of Forestry Canada, 1991). ; Ontario Ministry of Natural Resources, *Statistics: 1989-1990, a statistical supplement to the Annual Report of the Minister of Natural Resources for the year ending March 31, 1990*, (Toronto, Ontario, 1991). ; Statistics Canada, 1993, *Canadian Forestry Statistics, 1991*, Catalogue 25-202 page 9; Forest Industry Action Group, *Hard Choices - Bright Prospects: A Report and Recommendations from Labour, Industry and Government to the Ontario Minister of Natural Resources*, (Ontario Ministry of Natural Resources, Queens Printer, 1993).



17. Forestry Canada, *Selected forestry statistics: Information Report. E-X-41*, (Ottawa: Economics and Statistics Directorate of Forestry Canada, 1988). ; Forestry Canada, *Selected forestry statistics: Information Report E-X-44, E-X-46*, (Ottawa: Economics and Statistics Directorate of Forestry Canada, 1991).
18. Rowe, J. S. , *Forest Regions of Canada*, (Department of the Environment, Canadian Forestry Service Publications No. 1300, 1972). ; Wickware, G. and C. Rubec, *The Ecosystems of Ontario*, (Environment Canada. Land Classification Services No. 26. 19, 1989). ; Burns, R. M. and B. H. Honkala, *Silvics of North America Volume 1 and 2*. (Forest Service, United States Department of Agriculture, 1990). ; Maycock, P. F. , *The Phytosociology of the Deciduous Forests of Extreme Southern Ontario*, (Can. J. Bot. 41: 379-438, 1963). ; Maycock, P. F. and J. T. Curtis, *The Phytosociology of Boreal Conifer-hardwood Forests of the Great Lakes Region*, (Ecol. Monogr. 30:1-35, 1960).
19. Figures obtained from the Ontario Forest Resources data base
20. Ontario Ministry of Natural Resources, *Directory Primary Wood-Using Industries in Ontario, 1992*, (Draft) Forest Industries Section OMNR, Sault Ste Marie.
21. Northern Ontario Tourist Outfitters Association(NOTO), *Northern Resource-Based Tourism Industry - Issues Paper, 1994*.
22. Ontario Round Table on Environment and Economy, *Native Peoples Circle on Environment and Employment Report, 1992*.
23. Heidenreich, C. E. , *History of the Great Lakes-St. Lawrence area to A. D. 1650*, (Ontario Archaeology Society. Publ. #5, 1990). ; Theberge, J. B. , *Legacy: The Natural History of Ontario*, (Toronto: McClelland and Stewart, 1989).
24. Cwynar, L. C. , *The Recent Fire History of Barron Township, Algonquin Park*, (Can. J. Bot. 55:1526-1538, 1977). ; Van Wagner, C. E. , *Fire and Red Pine*, (Proc. Tall Timbers Fire Ecol. Conf. 10:221-224, 1971). ; Woods, G. T. and R. J. Day, *A Fire History Study of Quetico Provincial Park*, (Ontario Ministry of Natural Resources. Report #4. Ontario, 1977).
25. Ontario Ministry of Natural Resources, *Reconnaissance Inventory to Locate Old White and/or Red Pine Stands In Site Region 4E of the Ministry of Natural Resources, OMNR North Eastern Region, 1990*.
26. Figures obtained from the Ontario Forest Resources data base.
27. Ontario Ministry of Natural Resources, *Directory Primary Wood-Using Industries in Ontario 1992*, (Draft) Forest Industries Section OMNR, Sault Ste Marie.
28. Larson D. W. and P. E. Kelly, *The extent of old-growth Thuja occidentalis on cliffs of the Niagara Escarpment*, (Can. J. Bot. 69-7, 1991).



29. Forest Industry Action Group, *Hard Choices - Bright Prospects: A Report and Recommendations from Labour, Industry and Government to the Ontario Minister of Natural Resources*, (Toronto: Queen's Printer for Ontario).
30. Vegetation regions of P. F. Maycock derived from site regions of G. A. Hills.
31. Allen, G. M. , Eagles, P. F. J. and Price S. D. , *Conserving Carolinian Canada*, (Waterloo: University of Waterloo Press. 346 pp, 1990). ; Maycock, P. F. , *The Phytosociology of the Deciduous Forests of Extreme Southern Ontario*, (Can. J. Bot. 41: 379-438, 1963). ; Theberge, J. B. , *Legacy: The Natural History of Ontario*, (Toronto: McClelland and Stewart, 1989).
32. Figures obtained from the Ontario Forest Resources data base.
33. Ontario Ministry of Natural Resources, *Directory Primary Wood-Using Industries in Ontario 1992*, (Draft) Forest Industries Section OMNR, Sault Ste Marie. ; Ontario Ministry of Natural Resources, *Primary Wood-Using Industries Directory of The Southern Region of Ontario*, 1994.
34. Butler, J. R. and G. T. Hvenegaard, *The Economic Values of Bird Watching At Point Pelee National Park*, Ontario, (Canadian Parks Service, Environment Canada, 1989). ; Environment Canada, *The Importance of Wildlife to Canadians: Highlights of the 1991 survey*, (Canadian Wildlife Service, Minister of Environment, 1991).

### Chapter 3

1. Old Growth Policy Advisory Committee, *What We Heard - A Report on Public Consultations on Conserving Old Growth Red and White Pine*, (Toronto: Queen's Printer for Ontario, 1993).
2. Ontario Forest Policy Panel, *Diversity: Forests, People, Communities - A Comprehensive Forest Policy Framework for Ontario*, (Toronto: Queen's Printer for Ontario, 1991)
3. The Ontario Forest Policy Panel provides the following definition: "Healthy forests means that forest ecosystems are functioning in a natural way, and that human influence is not degrading any key ecological components or functions over the long term."

### Chapter 4

- 1 B. C. Ministry of Forests, *An Old Growth Strategy for British Columbia*, (Victoria : Q: Queen's Printer for British Columbia, 1992)





## Chapter 5

1. Wendaban Stewardship Authority, *Wendaban Stewardship Authority 20 Year Forest Stewardship Plan*, (Draft - Temagami, January 1994)
2. Towards an Ecosystem Approach to Land Use Planning: A Biophysical Environment Perspective, Ontario Ministry of the Environment, July 1992.
3. OMNR Endangered Spaces Action Plan - from Hills, 1959
4. Ontario Ministry of Natural Resources, *A Framework for the Conservation of Ontario's Biological Heritage*, (Toronto : Queen's Printer for Ontario, 1991)
5. Ontario's Forest Policy Panel, *Diversity : Forests, People, Communities - A Comprehensive Forest Policy Framework for Ontario*, (Toronto : Queen's Printer for Ontario, 1993)
6. Ontario Independent Forest Audit Committee, *A Report on the Status of Forest Regeneration*, (Toronto : Queen's Printer for Ontario, 1992)
7. Ontario Ministry of Natural Resources, *A Natural Heritage Areas Strategy for Ontario : Responding to the Endangered Spaces Challenge - Draft for Discussion*, (Toronto : Queen's Printer for Ontario, 1992) <sup>7</sup> Old Growth Forests Policy Advisory Committee, *Interim Report on Conserving Old Growth Red and White Pine*, (Toronto : Queen's Printer for Ontario, June 1993)
8. Canadian Environmental Advisory Council, *A Protected Areas Vision for Canada*, (Ottawa : Ministry of Supply and Services Canada, 1991)
9. The "Keep It Wild" Campaign was launched in 1994 by the Hon. Howard Hampton, Minister of Natural Resources, to meet the challenge of completing Ontario's protected areas network
10. Ontario Ministry of Natural Resources Tabloid, *Keep It Wild: Our Natural Heritage Areas*, (Toronto : Queen's Printer for Ontario, March 1994)
11. Ontario Ministry of Natural Resources, *A Natural Heritage Areas Strategy for Ontario : Responding to the Endangered Spaces Challenge*, (Toronto : Queen's Printer for Ontario, 1992)
12. Chaired by John Sewell, the Commission on Planning and Development Reform submitted its report in 1993, and the Ministry of Municipal Affairs responded with a consultation paper issued in December 1993.
13. Ontario Forest Policy Panel, *Diversity : Forests, People, Communities - A Comprehensive Forest Policy Framework for Ontario*, (Toronto : Queen's Printer for Ontario, 1991)
14. Ontario Ministry of Natural Resources, *Timber Management Planning Manual for Crown Lands in Ontario*, (Toronto : Queen's Printer for Ontario, 1988)



15. In its 1993 report *Diversity*, the Ontario Forest Policy Panel described a new forest culture emerging in Ontario, with forest sustainability as a lead theme.
16. The Old Growth Forests Policy Advisory Committee's Interim Report recommendation 2. 12 directed that such a model or framework be developed. No response has been received to this recommendation.
17. The Old Growth Forests Policy Advisory Committee's Interim Report recommendation 2. 11, "A methodology should be developed for quantifying all values of old growth forests in economic and non-economic terms. "
18. The Old Growth Forests Policy Advisory Committee's Interim Report recommendation 2. 12 "A model should be developed that can be used as a decision-making tool to weigh the socio-economic impacts of resource management decisions. The model should be tested in a number of case studies. "
19. See the 1992 and 1993 Old Growth Forests Policy Advisory Committee's Public Consultation Reports for further details of the public's interest in increased education and information about old growth forest ecosystems.
20. Ontario Forest Policy Panel, *Diversity : Forests, People, Communities - A Comprehensive Forests Policy Framework for Ontario*, (Toronto : Queen's Printer for Ontario, 1991) pages 86-87
21. In their June 1993 Interim Report on Conserving Old Growth Red and White Pine In Ontario, PAC recommended that "an audit program should be developed to monitor the on-the-ground delivery of the old growth management recommendations. Such a program should include monitoring for compliance and re-evaluation of policies, objectives and targets. Consideration should be given to using independent audit teams, as is the case with Forest Management Agreements". (Recommendation 4.5)



# APPENDIX A

## *Terms of Reference*

1. The Committee will recommend a strategy for the conservation of old growth forest ecosystems in Ontario. The strategy will:
  - address values associated with old growth ecosystems
  - have a strong basis in science
  - address issues identified by the Committee
  - provide alternative management actions
  - include an evaluation/assessment of the implications of the strategy
  - be consistent with the comprehensive forest planning framework.
2. The Committee will ensure that the broad range of public interested in old growth forest ecosystems in Ontario is involved in the development of the strategy.
3. The Committee will provide a report for the Minister of Natural Resources by December 31, 1993 that will recommend a strategy for the conservation of old growth forest ecosystems in Ontario. The report will provide a summary of the process and information used to arrive at the strategy. The report will consider the following:
  - i) Develop a working definition for old growth forest ecosystems and determine which forest ecosystems should be included for old growth consideration in Ontario.
  - ii) Identify information needs for locating and cataloguing old growth forest ecosystems.
  - iii) Describe the particular biological, social, cultural and economic values associated with old growth forest ecosystems based on a review of existing material, information gained from public input and from expert advice.
  - iv) a) Develop a framework for the conservation of representative old growth forest ecosystems now and into the future recognizing the cyclical nature of forest succession.  
b) As part of this objective the Committee will review existing and proposed conservation programs in Ontario and elsewhere for their appropriateness in addressing in the representative requirements.
  - v) Identify appropriate resource management practices that may be utilized to maintain old growth characteristics which provide for the biological, social, cultural and economic values associated with old growth.
  - vi) Recommend studies required to gain a better understanding of the characteristics and values associated with old growth forest ecosystems.





## APPENDIX B

### *Old Growth Policy Advisory Committee Members*

**Brennain Lloyd, (Chair)**

North Bay, Community Organizer with the northeastern environmental coalition,  
Northwatch

**Vivienne Ball, R.P.F.**

Sault Ste. Marie, Registered Professional Forester and Chief Forester, Lajambe Forest  
Products

**Tim Gray**

Toronto, Executive Director of the Wildlands League, Chapter of the Canadian Parks  
and Wilderness Society

**Mary Laronde**

Lake Temagami, Stewardship Director for the Teme-Augama Anishnabai

**Warren Mazurski**

Thunder Bay, Communication, Energy and Paperworkers Union

**Rev. Monica Moore**

Englehart, Englehart Pastoral Charge, United Church of Canada

**Bill McGuinty**

Kirkland Lake, Geologist for Queenston Mining Inc. and President of the Northern  
Prospectors' Association

**Paula Neice**

Kars, Senior Consultant, Ecologistics Ltd.

**Fiona White**

Port Hope, Environment Consultant, Northumberland-Clarington Board of Education

**Adele Crowder, (ex-officio)**

Kingston, Chair of the Scientific Advisory Committee



# APPENDIX C

## *Scientific Advisory Committee Members*

**Dr. Adele Crowder, (Chair)**

Queen's University, Department of Biology, Kingston

**Dr. Willard Carmean**

Lakehead University, School of Forestry, Thunder Bay

**Dr. David DeYoe**

Manager of Applied Science and Technology, OMNR Sault Ste. Marie

**Dr. Douglas Larson**

University of Guelph, Department of Botany, Guelph

**Dr. Paul Maycock**

University of Toronto, Department of Botany, Mississauga

**Dr. Peter Morrison**

ESSA Environmental and Social Systems Analysis Ltd. , Ottawa

**Dr. Jennifer Shay**

University of Manitoba, Department of Botany, Winnipeg, Manitoba

**Dr. Daniel Welsh**

Canadian Wildlife Service, Environment Canada, Ottawa



# APPENDIX D

## *Resource Managers Network Members*

**Colin Bowling**

Pine Program Forester, Ministry of Natural Resources, Kenora

**Tom Clark**

Resource Consultant, Bracebridge

**Carl Corbett**

Forester, Algonquin Forestry Authority, Huntsville

**Don Cuddy**

Ecologist, Ministry of Natural Resources, Kemptville

**Dave Deugo**

Forester, Ministry of Natural Resources, Bracebridge

**Don Fry**

Midway Lumber, Thessalon

**Lynn McIntyre**

Forester, Ontario Sawmill & Woodlot Operators Association, Perth

**Dennis O'Grady**

General Manager/Secretary Treasurer, South Nation River Conservation Authority, Berwick

**Ajith Perara**

Research Scientist, Ontario Ministry of Natural Resources, Sault Ste Marie

**Ron Reid**

Natural Resource Consultant, Washago

**Larry Ternent**

Forest Management Consultant, Swastika

**Barry Waito**

Resource Manager, Lajambe Forest Products Limited, Sault Ste. Marie





# APPENDIX E

## *Old Growth Red and White Pine Interim Report Recommendations, June 1993*

### *1. Inventory and Information*

- 1.1 An integrated information system should be developed that is compatible with existing resource data bases, such as the Forest Resources Inventory and the Ecological Land Classification/Forest Ecosystem Classification systems, and which:
  - a) incorporates completed Ecological Land Classification/Forest Ecosystem Classification systems for all regions of the province;
  - b) is compatible with a Geographic Information System and is functional at a field level;
  - c) is flexible enough to accommodate additional resource information that could be collected at the field level or by other agencies; and
  - d) incorporates a completed, digitized Forest Resources Inventory.
- 1.2 In each district of the province, maps should be prepared for all management units using the current Forest Resources Inventory that will:
  - a) identify red and white pine stands that are 121 years and older 1, and
  - b) identify which of these areas do not have road access.
- 1.3 Field staff at the district and regional levels should be trained to take full advantage of an integrated information system. Training should focus on using existing technology and providing opportunities for staff to participate in developing new data collection techniques that will allow the incorporation of local information into resource data bases.

### *2. Research Needs*

- 2.1 Old growth indices for red and white pine should be developed for use at the site region/site district level. The index should include such factors as:
  - age
  - minimum area
  - site conditions



- tree species composition
- tree density (number of stems per hectare)
- level of human disturbance
- species diversity
- spatial configuration (the favouring of sites that reduce forest fragmentation and build on contiguous areas or provide for corridors)
- structural diversity.

### *Ecological Research*

- 2.2 The disturbance sensitivity (or resilience) of old growth red and white pine ecosystems should be determined in order to understand how much disturbance can occur in an old growth forest and have it still qualify as an old growth forest ecosystem.
- 2.3 The nature of red and white pine regeneration and successional pathways should be more precisely determined (see Recommendation 2.10). This should include determining if exposed mineral soil is necessary for the regeneration of red and white pine. The effect of fire suppression on old growth red and white pine forest ecosystems over the long term should be determined.
- 2.4 It should be determined which plants and animals are dependent on old growth red and white pine forest ecosystems and for what parts of their life cycles.
- 2.5 A determination should be made of the levels of diversity occurring within relatively undisturbed red and white pine forest ecosystems, including structural, habitat, species and genetic diversity. The impacts of forest fragmentation on these variables should also be determined.
- 2.6 Forest inventory information for the pre-European settlement era should be assembled. This will allow comparisons to be made with current forest inventories, and will help determine restoration targets.

### *Management Research*

- 2.7 The minimum forest size required to maintain ecosystem function should be determined in order to assist in the evaluation and designation of protected areas.
- 2.8 Investigations should take place into the applicability of forest management practices that sustain biodiversity, maintain long term ecosystem health and old growth characteristics. These studies should:
  - a) focus on applications that can be implemented
  - b) develop and evaluate silvicultural techniques for providing old growth characteristics.



- 2.9 A field technique should be developed to determine the extent of heart rot in old red and white pine trees, so that only marketable trees are harvested and others can be retained as important components of the forest.
- 2.10 Ecosystem function in old growth areas that are relatively undisturbed should be monitored and evaluated against ecosystem function in areas that are being harvested, for comparative purposes. Case study areas should be selected for monitoring over the long term.

### *Socio-Economic Research*

- 2.11 A methodology should be developed for quantifying all values of old growth forests in economic and non-economic terms.
- 2.12 A model should be developed that can be used as a decision-making tool to weigh the socio-economic impacts of resource management decisions. The model should be tested in a number of case studies.

## **3. Protection**

- 3.1 Old growth red and white pine areas should be given priority when establishing new protected areas as a part of the network of ecologically representative areas. This should be done through the Natural Heritage Areas Strategy 2. Representation should be based on site districts.
- 3.2 The criteria for life science representation used by the OMNR to assess if areas should be included in the network of ecologically represented areas noted above should be amended to specifically include old growth red and white pine ecosystems as worthy of protection. Integrity measures should be added to the life science criteria. Specifically, area requirements for life science representation should provide for the spatial requirements of species inhabiting the forest, maintenance of ecological processes, gene pool conservation, ecological representation, uniqueness, and representation of all forest age classes.
- 3.3 Old growth red and white pine areas that are assigned for protection should be designated under legislation, such as an Ecological Reserves Act or an amended Parks Act.
- 3.4 Existing provincial and federal parks should be evaluated for their contribution to ecological representation by site district. Conservation Authority and other public lands under a protection regime should also be evaluated. In the short term, zoning should be used to protect old growth areas within provincial parks from human disturbance; over the long term, they should be protected under legislation as noted in recommendation 3.3.





- 3.5 The old growth red and white pine areas identified in the 1991 reconnaissance survey in Site Region 4E (the "Iles Report") should be evaluated for their contribution to site district representation. This should be a priority in the Natural Heritage Areas Strategy and should be completed by the end of 1993. Until this is done, cutting of those old growth red and white pine sites should continue to be deferred.
- 3.6 For the red and white pine range outside Site Region 4E, reconnaissance surveys should be undertaken to identify old growth red and white pine areas that meet regionally established size, composition and disturbance criteria. Because of the potential loss of old growth areas, immediate action is required for this recommendation (i.e. within three months of this report's release). After the survey is completed, cutting of red and white pine in the identified candidate sites should be deferred until evaluation of site district representation has been carried out (see 3.7).
- 3.7 Outside of Site Region 4E, areas of old growth red and white pine that have been identified in reconnaissance surveys should be evaluated for their contribution to site district representation. This work should concentrate first on the northwestern region, and should be completed by the end of 1994.
- 3.8 When old growth red and white pine areas are evaluated for ecological representation, social impacts should be assessed using the model outlined in 2.12. If, when evaluating areas for site district representation, there is a choice of areas that would satisfy the amended OMNR life science representation criteria, a socio-economic impact filter should be applied as a second level determinant.
- 3.9 Should the establishment of protected red and white pine areas result in mill closures, the Minister of Natural Resources should initiate discussions with appropriate federal and provincial agencies to explore opportunities and responsibilities for retraining and relocation assistance for workers and the establishment of adjustment committees.

#### *4. Forest Management Practices*

- 4.1 Some red and white pine trees should be retained in all harvested areas as seed sources, and as a genetic reservoir. The minimum spacing of these trees should be determined by forest geneticists and resource managers. This recommendation applies to all forest stands that contain white and/or red pine.
- 4.2 Old growth stand and structural characteristics should be retained in harvested areas, for habitat. These may include snags, trees with dead or dying tops and downed logs in various states of decay. In addition, components of each species and age group in multi-layered stands should be left intact on disturbed areas. This recommendation applies to all forest stands that contain white and/or red pine.



- 4.3 Prescribed silvicultural techniques that promote the natural regeneration of red and white pine should be the preferred option for all stands containing white and/or red pine. The next preferred option is natural supplemented with artificial regeneration; artificial regeneration is the last choice. Appropriate prescribed silvicultural techniques should be developed before harvest and should reflect site conditions and stand/structural characteristics.
- 4.4 Training programs should be developed, including programs focusing on the application of new technology, for people preparing and implementing resource management plans. These programs should make specific reference to the management of old growth forests, and should be developed and delivered for resource managers and workers in the field.
- 4.5 An audit program should be developed to monitor the on-the-ground delivery of the old growth management recommendations. Such a program should include monitoring for compliance, and re-evaluation of policies, objectives and targets. Consideration should be given to using independent audit teams, as is the case with Forest Management Agreements.
- 4.6 OMNR's "oldest first" harvesting principle should be abandoned. Other OMNR objectives and guidelines that affect the management of old growth forests should be evaluated to determine their appropriateness in retaining old growth characteristics.

## *5. Restoration*

- 5.1 A program should be initiated to increase the levels of red and white pine on the landscape by reintroducing pine onto sites that previously supported these species and by rehabilitating existing pine forests, using natural regeneration where possible.
- 5.2 Targets for restoration programs should be established at the management unit level. These should be consistent standards and measures for the assessment of the program's effectiveness.



## *Summary of 1993 Public Consultation Report*

The Old Growth Policy Advisory Committee (PAC) has accepted a report on public consultation which it conducted during November and December. The Committee was seeking advice from the public to assist in the development of a final report and recommendations on a conservation strategy for old growth forest ecosystems in Ontario.

To provide focus to the public consultation process, PAC used discussion points outlining the main areas of its work. What follows under the next five headings is a short synopsis of public opinion based on the discussion points and other issues identified by the public.

### *1. Landscape Management*

The Committee is proposing this as an "approach to land use planning undertaken in the context of the entire landscape as opposed to discrete parcels of land." It provides for protection of old growth and timber production.

- The public would support a new approach to land use planning which embodies Landscape Management and promotes biodiversity for Ontario forests.
- Landscape Management is too conceptual and vague, there should be more explanation of how it would be implemented and function.
- Some participants see the approach as too costly and bureaucratic.
- The approach should maintain an acceptable balance of both production and regeneration through intensive silviculture.
- There is support for a definition-index approach (in identifying old growth forests) which uses a general definition of old growth with specific applications for the different forest regions of the province.

### *2. Protection*

- There is general support for the principle that some areas should be set aside for protection.
- PAC cannot determine how much to protect until a full inventory of forest resources is completed.
- There are different protection objectives in each forest region of Ontario, the conservation strategy should reflect that.
- Some in northern Ontario feel there is enough old growth forest already protected there.
- An urgency was expressed about protecting remaining old growth forests in southern Ontario.





- PAC should encourage protection of old growth forest ecosystems on private land by suggesting tax rebates and incentives, stewardship programs, and municipal zoning.
- Education is of paramount importance.

### *3. Forest Management*

- There is a need for a clear, consistent policy for forest management in Ontario.
- in the north there is support for clear cutting practices in some circumstances.
- There is support for increasing and improving shelterwood and selective cutting practices in southern Ontario and the Great Lakes-St. Lawrence Forest.
- Workshop participants were often split on the use of fire as a management tool; there was also lack of consensus on suppression of forest fires.
- PAC's discussion of letting a portion of the forest go beyond normal rotation ages (extended rotation) raised concerns that it would reduce the wood supply; however it was also seen as a valid method for perpetuating old growth characteristics.

### *4. Socio-Economic Evaluation*

- There is a great deal of concern that the communities of northern Ontario which are heavily dependent on forest resources, will suffer if wood supply is reduced.
- Some people in the north asked for a delay in sending the final report to the Minister until there is a full impact assessment and socio-economic evaluation.
- Many communities in the north expressed a zero tolerance for job loss and mill closures.
- Compensation for economic losses should go to workers and their communities rather than to industry.
- There must be a balance struck between health of the economy and health of the environment; this was acknowledged by many as a difficult task.
- Several models for socio-economic evaluations were recommended to the committee.

### *5. Other Issues Identified by the Public*

- Education must be a key component of the conservation strategy; people want to know more about old growth forest ecosystems in Ontario.
- The strategy and policies should be developed on a provincial basis but must be applied according to local and regional concerns both ecologically and economically.
- Aboriginal peoples should be consulted in the development of a conservation strategy; jurisdiction of First Nations must be respected.



## *The Public Consultation Process*

The public consultation report was prepared by an independent consultant who gathered and analyzed information taken from public meetings, comment sheets, letters, submissions and telephone calls.

Material collected under the various components of public consultation was recorded, analyzed and incorporated into the consultant's report.

### *Public Meetings*

- More than 750 people attended six public meetings held between Nov. 22 and Dec. 1, 1993 in Timmins, Sault Ste. Marie, Dryden, Huntsville, Toronto and London.
- Participants took part in workshop discussions based on the committee's discussion points and facilitated by local volunteers. Reports from those workshops were recorded and became part of the public consultation input as were all comments and questions.
- In Dryden, meeting participants opted for an open forum discussion on old growth forest conservation instead of the workshop format. The meeting was recorded and became part of the public consultation input.

### *Comment Sheets*

- The committee asked the public seven specific questions based on the discussion points and solicited general comments; over 200 responses were collected.

### *Letters*

- The committee received 64 letters covering an array of topics related to old growth forests and represented a divergence of interests from across the province.

### *Submissions*

- Eight submissions (mostly published material) were received.

### *Telephone Calls*

- Call reports were taken by the Old Growth Forests Secretariat of telephone calls from the public.



# APPENDIX G

## *Summary of 1992 Public Consultation*

### *A Summary of Public Consultations on Conserving Old Growth Red and White Pine*

Public consultation is a crucial element in PAC's approach. Its public consultation program included six workshops (attended by over 500 people), a questionnaire (completed by 250 people), and a call for letters and submissions (almost 50 were received). Public input was generally constructive and positive. Most people supported a considerable degree of protection for old growth red and white pine. But many argued that the nature of red and white pine forest succession in Ontario makes it impossible to "preserve" old growth. Red and white pines eventually die, and, in the experience of people taking this view, they usually are replaced by other species, particularly in the absence of fire.

The solution suggested by many people is to focus on protecting and maintaining red and white pine in all age classes. As one person said, "If we are to have old growth forests in the future, we must have young forests today." This perspective took the consultation beyond the protection of specific tracts of old forest, to the idea of management for red and white pine. However, there remains great concern about today's old growth red and white pine forests, particularly since so little is left. Support was strong for interim protection for all of these stands. Some participants said that interim protection would be acceptable if decisions can be made quickly on which stands should receive continued protection. Participants from the forest industry, and others, emphasized that a lengthy freeze would be highly damaging to the industry, even if it was later reversed. Of our existing old growth, it was argued that some should be protected from all human intervention. The unique ecological, aesthetic, and spiritual qualities of such forests were mentioned frequently and widely acknowledged. Other old growth, many people felt, should be managed for old growth characteristics and pine succession. This would involve the use of fire and other techniques to increase the amount of pine in all age classes.

There was also support for a strategy that uses ecologically oriented forest management practices to gradually return a larger portion of Ontario's forest to a species and age class mix more representative of the landscape prior to settlement by Europeans. The result would be more red and white pine, and more old pine, than we have in Ontario today. From an ecological point of view, this would increase habitat for plant and animal life that may depend on old growth red and white pine forests.

As well, it was clear that many of those consulted did not see the issue in terms of trees or stands, but in terms of ecosystems. Said one person, "Old trees are part of a natural cycle. If our goal is to protect old growth forests, we don't protect the trees, we protect the cycle, the natural cycle that enables those trees to occur." There was general agreement that ecosystem protection is of paramount importance, in that without ecosystem health we will lose all the benefits that accrue from forests.





*"You cannot approach this on a purely scientific or ecological basis. The issues involves not just biological ethics, but also social ethics. "*

*"You only have to look at the problems of getting back a natural asset that has been lost to realize that when you have an asset you hang on to it. "*

*"It is important to recognize that old growth on any particular site may well be succeeded by a forest community which bears little resemblance to the existing stand. "*

*"The objective must be to adopt forestry practices which make sustainable forestry economically viable. "*

While individual trees and small stands may warrant protection, it is only in large stands and forests, or in smaller tracts connected by old growth corridors, that the species mix and interdependencies of an old growth ecosystem will be maintained. Moreover, people pointed out, there are many different types of old growth red and white pine ecosystems in Ontario. It is vital that none of these forest types be lost. In addition, many people argued that forest management must be site- and region-specific, with ecological, cultural, aesthetic, economic and other factors taken into consideration when deciding which old growth to protect, in what manner, and how to manage for more pine and more older forests in the future.

Such decisions, many people said, are not to be taken lightly, given the possible economic impacts of old growth protection in some communities across Northern Ontario. Since much of today's pine is already old, some people felt that blanket protection was both a waste of a valuable natural resource, and an unfair, "induced" economic hardship that would have a disastrous "ripple" effect as mills close. People involved in or dependent on the red and white pine forest industry emphasized repeatedly that a pine inventory must be used to determine whether the existing level of protection is in fact adequate.

However, it was thought by some consultation participants that commercial forestry can be carried out in an ecologically sound manner. They suggested that a reoriented forest industry could be economically viable, while restoring and preserving the health of forest ecosystems, providing diversity of wildlife habitats, increasing the pine component, and increasing the old growth component.

In its search for forestry alternatives, PAC was encouraged to explore west coast initiatives in "New Forestry". The basic idea driving New Forestry is that sustaining biodiversity and maintaining long-term ecosystem health, on a landscape basis, is the primary objective of forest management, with timber production viewed as one of the by-products of this primary objective. Because Ontario's forests differ so dramatically from those on the west coast, direct transfers of many New Forestry practices may not be possible. Nevertheless, many people felt the principles of New Forestry can be applied in Ontario.

Looking back over PAC's first year, it is apparent that the many people consulted have helped to clarify the fundamental, strategic policy issues. For example, how much red and white pine do we have in Ontario? How much red and white pine should we have in Ontario? How do wild area issues relate to the conservation of old growth forests? People felt that questions such as these could not be answered without more information. Especially, more information is needed on our inventory of the existing pine resource, and on the social, ecological and economic implications of various possible strategies.



## *Initiatives Included in OMNR's Sustainable Forestry Initiative*

- 1) **Comprehensive Forest Policy Framework**  
Sets out long-term objectives for sustaining Ontario's forests and provides a framework for developing detailed forest policies and practices.
- 2) **Silviculture**  
Research and Development Projects and Applied Ecology Projects that will increase the information available for managing the whole forest in a sustainable manner.
- 3) **Old Growth Conservation**  
A public Policy advisory committee and a Scientific Advisory Committee charged with making recommendations by the end of 1993 on an old growth forest ecosystem conservation strategy.
- 4) **Community Forestry**  
As part of developing a community forestry strategy, four pilot projects are underway that allow communities to increase their decision-making role in the management of local forests.
- 5) **Private Woodlands Strategy**  
A strategy to promote sustainable forestry on private lands and provide landowners with one-window access to government programs for woodland stewardship.
- 6) **Forest Audit**  
The audit was completed in October 1992. It showed the status of regeneration in boreal areas cutover between 1970 and 1985.
- 7) **Economic Projects**
  - a) **Forest Values**  
Development of a new forestry revenue system that reflects the financial values of both industrial and non-industrial (non-timber) uses of the forest.
  - b) **Timber Production Policy**  
Development of options for securing a sustainable supply of timber to meet Ontario's social, economic and environmental needs.



# APPENDIX I

## SPECIES ASSOCIATIONS OF ONTARIO

Species Associations in Ontario's Boreal Forest, Site Regions 2E, 3E, 3W, 3S and part of 4S.				
Species Associations	Common Site Descriptions	Common Associated Vegetation	Minimum Age for identifying potential old growth	Common life expectancy in old growth stands
Red / white pine conifer and mixedwood	dry to fresh	balsam fir and black spruce, rich shrub understory of hazel, and mountain maple; red pine stands can be shrub poor on drier coarse-textured soils	White pine 120 Red Pine 120	White pine 450+ Red pine 350+
Jack pine shrub rich/feather moss	dry to fresh, mineral soil, well drained	well developed herb and low shrub layer or open understory with carpet of feathermoss	Jack pine 70	Jack pine 140+
Black spruce/ jack pine	fresh coarse mineral soil	broadleaved species like large leaf aster, and sarsaparilla present on forest floor	Black spruce 100 Jack pine 70	Black spruce 200+ Jack pine 140+
Black spruce/ leatherleaf/sphagnum	deep wet organic soil	few tree species; shrubs include labrador tea and leatherleaf; alder on rich sites; sparse herb layer; continuous sphagnum or feathermoss	Black spruce 100	Black spruce 200+
White spruce/Balsam fir mixedwood and conifer	wide range of sites	black spruce, aspen, birch, jack pine across a range of sites; stands are floristically diverse	White spruce 100 Balsam fir 70	White Spruce 200+ Balsam fir 120+
Cedar/Mountain Maple	fresh to wet, broad soil range	balsam fir, white spruce and white birch; ericaceous shrubs lacking; broadleaf herbs present; some feathermoss	Cedar 110	Cedar 400+
Black spruce/cedar	wet organic soil	black spruce most common, white cedar and tamarack also dominate; grass and ericaceous shrubs common	Cedar 110 Tamarack 110 Black spruce 100	Cedar 400+ Tamarack 230+ Black spruce 200+
Hardwoods and mixedwoods	deep rich fresh to moist, imperfectly drained mineral soil	balsam poplar, black ash, Manitoba maple, understory shrub and herb rich;	Ash 120 Poplar 70	Ash 200+ Poplar 150+
Aspen, hardwood and mixedwood	deep, fresh, well drained upland mineral soil	aspen with fir, spruce and birch; herb and shrub layers rich and includes sarsaparilla, large leaf aster, bush honey suckle, mountain maple, beaked hazel	Aspen 70	Aspen 150+
White birch and mixedwood	deep, fresh to moist	other species include balsam fir, white and black spruce, jack pine; rich broadleaf herb layer	White birch 70	White birch 80+

Source: Policy Advisory Committee, adapted from draft OMNR Forest Ecosystem Classification information, age of life expectancy from Burns and Honkala; and from the professional opinion of the Old Growth Resource Managers Network.

The Committee has chosen the average species rotation age at a Provincial level, noted as minimum age on the table, as a starting point for identifying potential old growth forests. These ages provide an indication of when stands may begin to exhibit old growth structural and functional characteristics. They must be further refined at the regional and local level to reflect site differences and specific stand structural characteristics.





Species Associations in Ontario's Great Lakes-Saint Lawrence Forest Region, Site Regions 5S and part of 4S.				
Species Associations	Common Site Description	Common Associated Vegetation	Minimum Age for identifying potential old growth	Common life expectancy in old growth stands
Red / white pine conifer and mixedwood	dry to moist sites	jack pine on drier sites intolerant hardwoods on dry to moist sites; shrubs include bush honeysuckle, striped maple, sweetfern, bunchberry and creeping snowberry	Red pine 120 White pine 120	Red pine 350+ White pine 450+
Jack pine/ black spruce blueberry	dry to moist sites	white and red pine may occur; shrubs include alder, blueberry; herb poor	Jack pine 70 Black spruce 100	Jack pine 150+ Black spruce 200+
Black spruce/cedar	wet organics	cedar and black spruce dominate; other conifers are common such as balsam fir, tamarack, white spruce; ericaceous shrubs; herb rich on some sites	Black spruce 100 Cedar 110	Black Spruce 100+ Cedar 400+
White spruce/Balsam fir mixedwood and conifer	wide range of sites	black spruce, aspen, birch, jack pine across a range of sites; stands are floristically diverse	White spruce 100 Balsam fir 70	White Spruce 200+ Balsam fir 120+
Tolerant hardwoods	fresh to moist sites	sugar maple, yellow birch, hemlock, white pine, red oak, spruce and cedar may occur; rich understory of shrubs and herbs trillium, spring beauties, violets, dutchmen's breeches, twin flower	Hard maple 120 Yellow birch 120 Hemlock 140 Red Oak 120	Hard maple 300+ Yellow birch 300+ Hemlock 600+ Red oak 200+
Intolerant hardwoods/ conifer/mixedwood	dry to moist sites	aspen most abundant, also white birch, pines, cedar and spruce; rich herb layer including lady and interrupted ferns rich understory of shrubs	Aspen 70 White birch 70	Aspen 150+ White birch 80+

Source: Policy Advisory Committee, adapted from draft OMNR Forest Ecosystem Classification information, age of life expectancy from Burns and Honkala; and from the professional opinion of the Old Growth Resource Managers Network.

The Committee has chosen the average species rotation age at a Provincial level, noted as minimum age on the table, as a starting point for identifying potential old growth forests. These ages provide an indication of when stands may begin to exhibit old growth structural and functional characteristics. They must be further refined at the regional and local level to reflect site differences and specific stand structural characteristics.

## Species Associations in Ontario's Deciduous Forest, Site Regions 6E

Species Associations	Common Site Descriptions	Common Associated Vegetation	Minimum Age for identifying potential old growth	Common life expectancy in old growth stands
White pine	dry to fresh sites, sand to loam	hemlock can be a dominant; maple, ironwood, red oak, may also occur	White pine 120 Hemlock 140	White pine 450+ Hemlock 600+
Red cedar	dry shallow calcareous	includes pine and bur oak occurs on old farm fields	Red cedar 110	Red cedar 200+
Mixedwoods	dry to fresh, on a wide range of soil types	balsam fir, birch and hemlock on rich sites; white pine, maple, basswood on drier sites rich herb layer including lady fern and interrupted fern	Cedar 110	Cedar 400+
Sugar maple/tolerant hardwoods	fresh to moist, rich soils	numerous other hardwood species also dominant - frequently beech, ironwood, basswood, ash, hickory, tulip trees; rich shrub and herb layer	Hard maple 120 Beech 120 Tulip tree 120 Basswood 120	Hard maple 200+ Beech 300+ Tulip tree 300+ Basswood 200+
Black oak	dry, shallow, sandy sites	hickory, aspen, and sassafras can be present	Black oak 120	Black oak 300+
Red, white and bur oak	dry sites and sand loam	pine and aspen also can occur as dominants	Red oak 120 White oak 120 Bur oak 120	Red oak 200+ White oak 200+ Bur oak 200+
Rich lowland hardwoods	wet sites ranging from loam, clay to organic soil	Dominants include silver maple, black ash, red maple, green ash, black willow, hackberry and swamp white oak	Silver maple 120 Hard Maple 120 Ash 120	Silver maple 200+ Hard maple 150+ Ash 200+

Source: Policy Advisory Committee, adapted from draft OMNR Forest Ecosystem Classification information, age of life expectancy from Burns and Honkala; and from the professional opinion of the Old Growth Resource Managers Network.

The Committee has chosen the average species rotation age at a Provincial level, noted as minimum age on the table, as a starting point for identifying potential old growth forests. These ages provide an indication of when stands may begin to exhibit old growth structural and functional characteristics. They must be further refined at the regional and local level to reflect site differences and specific stand structural characteristics.



# APPENDIX J

## Trees of Ontario

<u>Latin Names</u>	<u>English Names</u>	<u>Latin Names</u>	<u>English Names</u>
<b>ANGIOSPERMS</b>			
<b>Aesculus</b>		<b>Cornus</b>	
<i>Aesculus glabra</i>	Ohio buckeye	<i>Cornus alternifolia</i>	Alternate-leaved Dogwood
		<i>Cornus florida</i>	Flowering dogwood
<b>Acer</b>		<b>Crataegus</b>	
<i>Acer negundo</i>	Manitoba maple	<i>Crataegus spp.</i>	Hawthorn species
<i>Acer nigrum</i>	Black maple		
<i>Acer rubrum</i>	Red maple	<b>Fagus</b>	
<i>Acer saccharinum</i>	Silver maple	<i>Fagus grandifolia</i>	American beech
<i>Acer saccharum</i>	Sugar maple		
<b>Amelanchier</b>		<b>Fraxinus</b>	
<i>Amelanchier arborea</i>	Downy serviceberry	<i>Fraxinus americana</i>	White ash
		<i>Fraxinus nigra</i>	Black ash
<b>Asimina</b>		<i>Fraxinus pennsylvanica</i>	Red ash
<i>Asimina triloba</i>	Pawpaw	<i>Fraxinus pennsylvanica</i> var. <i>subintegerrima</i>	Green ash
<b>Betula</b>		<i>Fraxinus profunda</i>	Pumpkin ash
<i>Betula alleghaniensis</i>	Yellow birch	<i>Fraxinus quadrangulata</i>	Blue ash
<i>Betula lenta</i>	Cherry birch		
<i>Betula papyrifera</i>	Paper birch	<b>Gleditsia</b>	
<i>Betula populifolia</i>	Gray birch	<i>Gleditsia triacanthos</i>	Honey-locust
<b>Carpinus</b>		<b>Gymnocladus</b>	
<i>Carpinus caroliniana</i>	Blue beech	<i>Gymnocladus dioica</i>	Kentucky coffee-tree
<b>Carya</b>		<b>Juglans</b>	
<i>Carya cordiformis</i>	Bitternut hickory	<i>Juglans cinerea</i>	Butternut
<i>Carya glabra</i>	Pignut hickory	<i>Juglans nigra</i>	Black walnut
<i>Carya laciniosa</i>	Big shellbark hickory		
<i>Carya ovata</i>	Shagbark hickory	<b>Liriodendron</b>	
<b>Castanea</b>		<i>Liriodendron tulipifera</i>	Tulip tree
<i>Castanea dentata</i>	American chestnut	<b>Magnolia</b>	
<b>Celtis</b>		<i>Magnolia acuminata</i>	Cucumber tree
<i>Celtis occidentalis</i>	Hackberry	<b>Malus</b>	
<i>Celtis tenuifolia</i>	Dwarf hackberry	<i>Malus coronaria</i>	Wild crab apple





<u>Latin Names</u>	<u>English Names</u>
<b>Morus</b> <i>Morus rubra</i>	Red mulberry
<b>Nyssa</b> <i>Nyssa sylvatica</i>	Black gum
<b>Ostrya</b> <i>Ostrya virginiana</i>	Ironwood
<b>Platanus</b> <i>Platanus occidentalis</i>	Sycamore
<b>Populus</b> <i>Populus balsamifera</i> <i>Populus deltoides</i> <i>Populus grandidentata</i> <i>Populus tremuloides</i>	Balsam poplar Eastern cottonwood Big-tooth aspen Trembling aspen
<b>Prunus</b> <i>Prunus pensylvanicum</i> <i>Prunus serotina</i>	Pin cherry Black cherry
<b>Ptelea</b> <i>Ptelea trifoliata</i>	Hop tree
<b>Quercus</b> <i>Quercus alba</i> <i>Quercus bicolor</i> <i>Quercus ellipsoidalis</i> <i>Quercus macrocarpa</i> <i>Quercus muehlenbergii</i> <i>Quercus palustris</i> <i>Quercus rubra</i> <i>Quercus shumardii</i> <i>Quercus velutina</i>	White oak Swamp white oak Hill's oak Bur oak Chinquapin oak Pin oak Red oak Shumard oak Black oak
<b>Rhus</b> <i>Rhus glabra</i> <i>Rhus typhina</i> <i>Rhus vernix</i>	Ohio sumac Staghorn sumac Poison sumac
<b>Salix</b> <i>Salix amygdaloides</i> <i>Salix nigra</i>	Peach-leaf willow Black willow

<u>Latin Names</u>	<u>English Names</u>
<b>Sassafras</b> <i>Sassafras albidum</i>	Sassafras
<b>Sorbus</b> <i>Sorbus americana</i> <i>Sorbus decora</i>	American Mountain-ash Showy mountain-ash
<b>Tilia</b> <i>Tilia americana</i>	Basswood
<b>Ulmus</b> <i>Ulmus americana</i> <i>Ulmus rubra</i> <i>Ulmus thomasii</i>	White elm Slippery elm Rock elm
<b>GYMNOSPERMS</b>	
<b>Abies</b> <i>Abies balsamea</i>	Balsam fir
<b>Juniperus</b> <i>Juniperus virginiana</i>	Eastern red cedar
<b>Larix</b> <i>Larix laricina</i>	Tamarack
<b>Picea</b> <i>Picea glauca</i> <i>Picea mariana</i> <i>Picea rubens</i>	White spruce Black spruce Red spruce
<b>Pinus</b> <i>Pinus banksiana</i> <i>Pinus resinosa</i> <i>Pinus rigida</i> <i>Pinus strobus</i>	Jack pine Red pine Pitch pine White Pine
<b>Thuja</b> <i>Thuja occidentalis</i>	Northern white cedar
<b>Tsuga</b> <i>Tsuga occidentalis</i>	Eastern hemlock

Nomenclature follows Morton and Venn (1990) and english names were supplied by O. M. N. R.



# BIBLIOGRAPHY

- Ahlgren, I. F. and C. E. Ahlgren. 1960. Ecological effects of forest fires. *Bot. Rev.* 26:483-533.
- Alexander, M. E. 1980. Forest fire history research in Ontario. Fire History Workshop, University of Arizona. Tucson, Arizona.
- Allen, G. M., P. F. J. Eagles, and S. D. Price. 1990. Conserving Carolinian Canada. University of Waterloo Press. Waterloo, Ontario. 346 pp.
- Auclair, A. N. and F. G. Goff. 1971. Diversity relations in upland forests in the western Great Lakes area. *Amer. Nat.* 105:499-528.
- Birks, H. J. B. and H. H. Birks. 1988. Quaternary palaeoecology. University Park Press. Baltimore.
- Bormann, F. H., G. E. Likens, D. W. Fisher and R. S. Pierce. 1986. Nutrient loss accelerated by clear cutting of a forest ecosystem. *Science* 159:882-84.
- Brown, D. M., G. A. McKay, and L. J. Chapman. 1968. The climate of southern Ontario. Department of Transport. Climatological Studies #5.
- Buchert, G. P. 1993. Genetics of white pine and implications for management and conservation. Paper presented at a workshop on Red and White pine October 6, 1993 Chalk River, Ontario.
- Burnett, J. A., C. T. Dauphine, S. McCrindle and T. Mosquin. 1989. On the brink endangered species in Canada. *Min. Supp. Services. Can.* EN 40-366.
- Burns, Russell M. and Barbara H. Honkala. 1990. Silvics of North America Volume 1 and 2. Forest Service, United States Department of Agriculture.
- Butler, J. R. and G. T. Hvenegaard. 1989. The economic values of bird watching at Point Pelee National Park, Ontario. Canadian Parks Service, Environment Canada.
- Canada Atmospheric Environment Service. 1991. Climate change and Canadian impacts.
- Canadian Council of Forest Ministers, 1993. Compendium of Canadian forestry statistics.
- Canadian Environmental Advisory Council. 1991. A protected areas vision for Canada.



- Carleton, T. J. and R. W. Arnup.** 1993. Vegetation ecology of eastern white pine and red pine forests in Ontario. Ontario Ministry of Natural Resources.
- Chapman, L. J. and D. F. Putnam.** 1951. The physiography of southern Ontario. University of Toronto Press, Toronto.
- Chapman, L. J. and M. K. Thomas.** 1968. The climate of Northern Ontario. Department of Transport. Climatological Studies #6.
- Cwynar, L. C.** 1977. The recent fire history of Barron Township, Algonquin Park. Can. J. Bot. 55:1526-1538.
- Day, R. J.** 1990. The dynamic nature of Ontario's forests from post glacial times to the present day. Old Growth Forests Conf. Proc. University of Toronto. Canadian Scholar's Press Ltd. Toronto.
- Day, R. J. and E. M. Harvey.** 1981. Forest dynamics in the boreal mixedwood. In Boreal Mixedwood Symposium. Sym Proc 0-P-9 Can. For. Serv. Great Lakes For. Res. Centre.
- Earthroots.** 1993. The old-growth boreal forest - An introduction to the boreal forest ecosystem.
- Environment Canada.** 1991. The importance of wildlife to Canadians: Highlights of the 1991 survey. Canadian Wildlife Service, Minister of Environment.
- Environmental Assessment Board.** Class environmental assessment of an undertaking by the Ministry of Natural Resources for the activity of timber management on Crown lands in Ontario. Statement of Evidence Panel IV: Ontario's Wood Supply. 1988.
- Forest Industry Action Group.** 1993. Hard choices-Bright prospects: A report and recommendations from labour, industry and government to the Ontario Minister of Natural Resources. Ontario Ministry of Natural Resources. Toronto: Queens Printer for Ontario.
- Forestry Canada.** 1988. Selected forestry statistics: Information Report E-X-41. Economics and Statistics Directorate of Forestry Canada, Ottawa, Ontario.
- Forestry Canada.** 1992. The State of Canada's Forest.
- Forestry Canada.** 1991. Selected forestry statistics: Canada 1990. Information Report E-X-44, Economics and Statistics Directorate of Forestry Canada, Ottawa, Ontario.
- Fritz, P. , A. V. Morgan, U. Eicher and J. H. McAndrews.** 1987. Stable isotope, fossil Coleoptera and pollen stratigraphy in Late Quaternary sediments from Ontario and New York State. Palaeogeography, Palaeoclimatology, Palaeoecology 58: 183-202.





- Gorrie, P.** 1994. The enchanted woodland. *Canadian Geographic*. March/April 1994.
- Hammond, Herb.** Seeing the forest among the trees - The case for wholistic forest use. Vancouver: Polestar Press Ltd.
- Hare, F. K. and M. K. Thomas.** 1979. *Climate Canada*. J. Wiley and Sons. Toronto.
- Heidenreich, C. E.** 1990. History of the Great Lakes-St. Lawrence area to A. D. 1650. Ontario Archaeology Society. Publ. #5.
- Heinselman, M. L.** 1970. Preserving native forested wilderness areas and National Parks. *Nat. Parks and Conservation Magazine* 44:8-16.
- Heinselman, M. L.** 1973. Fire in the virgin forests of the Boundary Waters Canoe Area Minnesota. *Quar. Res.* 3: 329-382.
- Heinselman, M. L.** 1981. Fire intensity and frequency as factors in the distribution and structure of northern ecosystems. U. S. D. A. For. Serv. Tech. Rep. WO-26.
- Hills, G. A.** 1959. A ready reference to the description of the land of Ontario and its productivity. Division of Research, Ontario Department of Land and Forests.
- Hummel, M.** 1989. Endangered spaces: The future for Canada's wilderness. Key Porter Books. Toronto.
- Jacob, J. , O. L. Lange and J. S. Olsen.** 1976. *Genetics of forest ecosystems*. Springer Verlag. New York.
- Jafri, S. U. H.** 1965. Forest composition in the Frontenac Axis of Ontario. M. Sc. Thesis, Queens University, Kingston, Ontario.
- Jones, R. K. , G. Pierpoint, G. M. Wickware, J. K. Jeglum, R. W. Arnup and J. M. Bowles.** 1983. Field guide to forest ecosystem classification for the Clay Belt, Site Region 3E. Agriculture Canada and Ontario Ministry of Natural Resources. Toronto: Queens Printer for Ontario.
- Joyce, D. and B. Graham.** 1994. Genetic heritage: Program prospectus. Ontario Forest Research Institute, Ontario Ministry of Natural Resources. Sault Ste Marie.
- Kimmins, J. P.** 1987. *Forest ecology*, Macmillan Publishing Company.
- Krause, H. H. and G. F. Weetman and P. A. Arp.** 1980. Nutrient cycling in boreal forest ecosystems of North America. *Pro. 5th N. Amer. For. Soils. Conf. Col.* p387-319.



- La Roi, G. H.** 1967. Ecological studies of the boreal spruce-fir forest of the North America Taiga. *Ecol. Monogr.* 37:229-253.
- Larsen, J. A.** 1980. The boreal ecosystem. Academic Press. New York.
- Larson, D. W. and P. E. Kelly.** 1991. The extent of old-growth *Thuja occidentalis* on cliffs of the Niagara Escarpment. *Canadian Journal of Botany* Volume 69 Number 7.
- Ledig, F. T.** 1988. The conservation of diversity in forest trees. *Bioscience* 38: 471-479. 77.
- Leopold, A.** 1949. A Sand County Almanac. Oxford University Press, New York.
- Liu, K. B.** 1982. Post glacial vegetational history of Northern Ontario. Ph. D. thesis. University of Toronto.
- Lynham, T. J. and B. J. Stocks.** 1989. Natural fire regime of an unprotected section of the boreal forest in Canada. *Proc. 17th Tall Timbers Fire Ecology Conf.* Florida.
- Maser, Chris.** 1988. The redesigned forest. R&E Miles California.
- Maycock, P. F.** 1962. The phytosociology of the deciduous forests of extreme southern Ontario. Dept. of Botany, McGill University, Montreal.
- Maycock, P. F.** 1963. The phytosociology of the deciduous forests of extreme southern Ontario. *Can. J. Bot.* 41: 379-438.
- Maycock, P. F. and J. T. Curtis.** 1960. The phytosociology of boreal conifer-hardwood forests of the Great Lakes Region. *Ecol. Monogr.* 30:1-35.
- McAndrews, J. H.** 1988. Human disturbance of North American forests and grasslands: The fossil pollen record. *Vegetation History* Kluwer Academic Publishers. New York. 673-697.
- Northern Ontario Tourist Outfitters Association (NOTO).** 1994. Northern resource-based tourism industry-Issues Paper.
- Old Growth Policy Advisory Committee.** 1993. Interim report on conserving old growth red and white pine. Toronto: Queen's Printer for Ontario.
- Oliver C. D. and B. C. Larsen.** Forest stand dynamics. McGraw Hill. New York. 1990.
- Ontario Forest Policy Panel.** 1993. Diversity: Forests, People, Communities - A comprehensive forest policy framework for Ontario. Toronto: Queen's Printer for Ontario.



- Ontario Independent Forest Audit Committee.** 1992. A report on the status of forest regeneration. Ontario Ministry of Natural Resources, Sault Ste. Marie.
- Ontario Ministry of the Environment.** 1992. Towards an ecosystem approach to land use planning: A biophysical environment perspective.
- Ontario Ministry of Natural Resources.** 1980. A framework for the conservation of Ontario's biological heritage.
- Ontario Ministry of Natural Resources.** A natural heritage areas strategy for Ontario: Responding to the endangered spaces challenge. Draft strategy.
- Ontario Ministry of Natural Resources.** 1988. A silvicultural guide for the spruce working group in Ontario. Science and Technology Series, Volume 4.
- Ontario Ministry of Natural Resources.** 1988. A silvicultural guide for the tolerant hardwoods in Ontario. Science and Technology Series, Volume 7.
- Ontario Ministry of Natural Resources.** 1991. Direction'90s. . Toronto: Queen's Printer for Ontario.
- Ontario Ministry of Natural Resources.** 1992. Directory primary wood-using industries in Ontario 1992. (Draft) Forest Industries Section, OMNR, Sault Ste Marie.
- Ontario Ministry of Natural Resources.** 1994. Keep It Wild: Our natural heritage areas. OMNR tabloid.
- Ontario Ministry of Natural Resources.** 1994. Primary wood-using industries directory of the Southern Region of Ontario, 1994.
- Ontario Ministry of Natural Resources.** 1990. Reconnaissance inventory to locate old white and/or red pine stands in Site Region 4E of the Ministry of Natural Resources. OMNR Northeastern Region.
- Ontario Ministry of Natural Resources.** 1991. Statistics: 1989-1990, a statistical supplement to the Annual Report of the Minister of Natural Resources for the year ending March 31, 1990. Toronto: Queen's Printer for Ontario.
- Ontario Ministry of Natural Resources.** 1993. The timber resources of Ontario-1993. Forest Policy Branch. Sault Ste. Marie, Ontario.
- Ontario Ministry of Natural Resources.** 1988. Timber Management Planning Manual for Crown Lands in Ontario. .





**Ontario Native Affairs Secretariat, Statement of Political Relationship**, (Toronto: Ontario Native Affairs Secretariat, 1991). The statement was signed by Ontario Regional Chief Gordon Peters, Chiefs of Ontario; Grand Chief Joe Miskokomom, Union of Ontario Indians; Grand Chief Harry Doxtator, Association of Iroquois and Allied Indians; Grand Chief Bentley Cheechoo, Nishnawbe-Aski Nation; Grand Chief Mike Mitchell, Mohawks of Akwesasne First Nation; Chief William Montour, Six Nations of the Grand River First Nation; Chief Roy McDonald, Islington First Nation; Chief Howard Pamajewon, Shawanaga First Nation; Chief Gary Potts, Teme-Augama Anishnabai first Nation; Chief George St. German, Chippewas of Rama First Nation; Chief Doug Sinoway, Whitesand First Nation; Bob Rae, Premier of Ontario; and C. J. (Bud) Wildman, Ontario Minister Responsible for Native Affairs. Toronto: Ontario Native Affairs Secretariat.

**Ontario Round Table on Environment and Economy**. 1992. Native Peoples Circle on Environment and Employment Report.

**Pritchett, W. L. and R. F. Pritchett**. 1987. Properties and management of forest soils. John Wiley and Sons, New York.

**Quinby, P. A.** 1991. Global status report on old growth white pine forests. Temagami Wilderness Fund Report. Toronto, Ontario.

**Ritchie, J.** 1987. Postglacial vegetation of Canada. Cambridge University Press. Cambridge, U. K.

**Riley, J. L. and P. Mohr**. 1994. The natural heritage of southern Ontario's settled landscapes. A review of conservation and restoration ecology for land-use and landscape planning. Ontario Ministry of Natural Resources, Southern Region, Aurora, Science and Technology Transfer, Technical Report TR-001. 78 pp.

**Rowe, J. S.** 1972. Forest regions of Canada. Department of the Environment, Canadian Forestry Service Publication No. 1300.

**Russell, E. W. B., R. B. Davis, R. S. Anderson, T. E. Rhodes and D. S. Anderson**. 1993. Recent centuries of vegetational change in the glaciated north-east United States. *J. Ecol.* 81:647-666.

**Schneider, S.** 1989. Global warming. Sierra Club Books, San Francisco.

**Shugart H. H.** 1986. A theory of forest dynamics. Springer Verley, New York.

**Sims, R. A., H. M. Kershaw, G. M. Wickware**. 1990. The autecology of major tree species in the North Central Region of Ontario. COFRDA report 3302, NWOFTDU Technical Report 48.

**Society of American Foresters**. 1991. The task force report biological diversity in forest ecosystems. SAF-91-03. Society of American Foresters, Bethesda, Maryland.



- Solomon, A. M. and H. H. Shugart.** 1993. Vegetation dynamics and global change. Chapman and Hall, New York.
- Spurr, S. H.** 1964. Forest ecology. The Ronald Press Company, New York.
- Stelfox, B.** 1993. Boreal forests biodiversity and logging. Forestry on the Hill. The Can. For. Assoc. Special Issue #5. Ottawa.
- Statistics Canada.** 1993. Canadian forestry statistics: 1991. Catalogue 25-202, page 9.
- Terasmae, J.** 1969. A discussion of deglaciation and the boreal forest history in the Northern Great Lakes Region. Proc. Entomological Soc. Ontario. 99:31-43.
- Terasmae, J. and M. L. Mathews.** 1980. Late Wisconsin white spruce at Brampton, Ontario. Can. J. Earth Sc. 17:1087-1095.
- Theberge, J. B.** 1989. Legacy: The natural history of Ontario. McClelland and Stewart. Toronto.
- Transeau, E. N.** 1935. The prairie peninsula. Ecology, 16 423-437.
- Van Wagner, C. E.** 1971. Fire and red pine. Proc. Tall Timbers Fire Ecol. Conf. 10:221-224.
- Ward, P. C. and A. G. Tithecott.** 1993. The impact of fire management on the boreal landscape of Ontario. Ontario Ministry of Natural Resources.
- West, D. C., H. H. Shugart and D. B. Botkin.** 1981. Forest succession: Concepts and application. Springer Verley. New York.
- Wickware, G. and C. Rubec.** 1989. The ecoystems of Ontario. Environment Canada. Land Classification Services No. 26.
- Woods, G. T. and R. J. Day.** 1977. A fire history study of Quetico Provincial Park. Ontario Ministry of Natural Resources. Report #4. Ontario.
- World Commission on Environment and Development.** 1987. Our common future. New York: Oxford University Press.
- World Conservation Union, United Nations Environment Programme, and World Wide Fund for Nature.** 1991. *Caring for the earth: A strategy for sustainable living.* Gland, Switzerland: The World Conservation Union / United Nations Environment Programme / World Wide Fund for Nature.
- Yang, R. C. and R. D. Fry.** 1981. Natural succession following harvesting in the boreal mixedwood forest. In the Boreal Mixedwood Symposium. Sym. Proc. 0-P-9 Can. For. Serv. Great Lakes For. Res. Centre.



# GLOSSARY OF TERMS

**Areas of Natural and Scientific Interest:** areas of land and water containing natural landscapes or features which have been identified as having values related to protection, natural heritage appreciation, scientific study or education, (Implementation Strategy: Areas of Natural and Scientific Interest, OMNR, 1988).

**Biodiversity:** (also known as biological diversity), the variety of life in all its forms, levels and combinations. Includes ecosystem diversity, species diversity, and genetic diversity, (IUCN/UNEP/WWF, Caring for the Earth, 1991).

**Clearcutting:** the removal in one operation of the entire commercial crop of a desired species of tree in one section of forest; clearcuts may be of different sizes or shapes, and are often done as block or strip cutting, (OMNR, "Forest Files", Spring 1988).

**Conservation:** the management of human use of ecosystems to ensure that such use is sustainable. Conservation includes protection, maintenance, rehabilitation, restoration, and enhancement of populations and ecosystems. (International Union for the Conservation of Nature).

**Conservation Authority:** an autonomous corporate body established under the Conservation Authorities Act (which is administered by the Ministry of Natural Resources) to further the conservation, restoration, development and management of natural resources other than gas, oil, coal and minerals (Government of Ontario, KWIC Index to Services, 1990-91).

**Consumptive Use:** a use resulting in physical products and/or economic benefits; the physical products may provide economic benefits and the economic benefits may yield physical products. Consumptive uses include, among others, timber harvesting, trapping, mineral extraction, tourism and some forms of recreation.

**Crown Land:** land whose ownership still rests with the Province of Ontario and has never been disposed of.

**Dominant:** generally an individual or species of the upper layers of the canopy. Of a species in a mixed crop, that is the most numerous and vigorous (OMNR, Timber Management Planning Manual, 1986).

**Ecological Land Classification/Forest Ecosystem Classification:** Forest Ecosystem Classification is a type of Ecosystem Land Classification. Both are systems which attempt to provide a means to stratify a complex forest mosaic into more or less homogeneous land units, (K. R. Jones, paper presented at "Impact of Intensive Harvesting on Forest Site Productivity Workshop", March 5-12, 1989, New Zealand).





**Ecological Representation:** the basis for selecting natural areas to represent the range of ecosystems found in Ontario. (Provincial Parks and Natural Heritage Policy Branch, OMNR, A Natural Heritage Areas Strategy for Ontario, 1992).

**Ecosystem:** a dynamic system of plants, animals and other organisms together with the nonliving components of their environment, (IUCN/UNEP/WWF, Caring for the Earth, 1991).

**Ecosystem Approach:** a holistic or ecological approach which considers the effect of specific actions or decisions on the functioning and health of the host ecosystem.

**Extended Rotation:** extended rotation means forest stands are harvested after the normal harvest age, ie final harvest is at an age older than the normal harvest age - to provide structural diversity and habitat, and representation of all age classes, including the oldest age classes.

**Forest:** an ecosystem dominated by trees, with their associated plants, animals and ecological processes.

**Forest Fragmentation:** a change in the landscape from the continuous forest cover to a pattern of forest patches. There may be a progressive reduction in the number or size of forest patches. The degree of fragmentation is related to the spatial scale of the inventory, the similarity in the forest and non-forest patch cover, and the state of the pre-fragmented landscape.

**Forestry:** a profession embracing the science, business, and art of creating, conserving, and managing forests for the continuing use of their resources, (adapted from OMNR, Timber Management Planning Manual, 1986).

**Forest Health:** Forest health is a concept used to describe the ability of a forest to withstand both human-caused and natural stresses, and still provide the values that are placed on it by people. (OMNR, Fact Sheet, March 1992, Ontario Forest Health Unit, Tweed, Ontario)

**Forest Management Agreement:** A contractual agreement between the Ministry of Natural Resources and a company under the Crown Timber Act to provide a continuous supply of forest products from the designated lands for the wood-processing plants of the company and to ensure that the forests on such lands are harvested and regenerated to produce successive crops of timber on a sustained yield basis ( OMNR, Timber Management Planning Manual, 1986).

**Geographic Information System:** a set of software tools that allows staff to compile, store, retrieve, analyze, compare and display geographic information. It deals with the location, and physical properties of any object or feature in the real world.

**Hectare:** an area of land equal to 2. 47 acres; about the size of two Canadian football fields.



**Intolerant Tree Species:** trees that require full sun light for optimal growing conditions

**Inventory:** consists of statistics, maps, photographs and a computerized data base that provides information on each of the province's forest management units, (OMNR, "Forest Files", Spring 1988).

**Keep It Wild:** a program announced by the Minister of Natural Resources on March 9, 1994 to complete Ontario's system of provincial parks and protected areas by the year 2000, and to respond to the Endangered Spaces challenge of the World Wildlife Fund Canada.

**Landscape Management:** managing forest structures to provide a range of stand conditions and hence a broader balance of biodiversity and habitats (Journal of Forestry(December/93) by Lippke and Oliver).

**Management:** when used in the term "forest resource management", management refers, in this report, to any action or decision that is made regarding an area of forested land that is under the administration of a forest resource manager.

**Management Unit:** a forest estate administered and operated according to one management plan. In Ontario three kinds of timber management units are common: (i) Crown management units, managed by OMNR; (ii) Company management units, managed by a company and OMNR jointly; and (iii) Forest Management Agreement forests which are managed by a company or agreement holder, and audited by OMNR.

**Mixedwood Forests:** forest associations that contain both coniferous and deciduous tree species.

**New Forestry:** an approach to forest management developed for old growth Douglas fir forests of the western Cascades and coastal areas of Oregon and Washington; new forestry advocates managing forests as whole ecosystems, not just stands of timber; the philosophy is that sustaining biological diversity and maintaining long-term ecosystem health is the primary objective of forest management, and that timber management should be viewed as one byproduct of this primary objective.

**Old Growth Structural Characteristics:** include but are not limited to snags, trees with dead or dying tops, downed logs in various states of decay, and a multi-layered canopy.

**Old Growth Forests:** ecosystems characterized by the presence of old trees with their associated plants, animals, and ecological processes. They show little or no evidence of human disturbance, (Ontario, Old Growth Policy Advisory Committee, 1994).

**Pre-settlement Forest:** the forest that was present prior to European settlement; the distinction between pre- and post-European settlement acknowledges that there was a human presence and utilization of forests during pre-European times, but that the impacts of extensive agriculture, industry and extractive uses on the forest occurred following European settlement.



**Production Forest:** all productive forest land managed primarily for growing timber for industry, unless otherwise reassigned, (OMNR, Timber Management Planning Manual, 1986).

**Productive Forest Land:** forest land that is capable of producing a merchantable stand within a reasonable length of time, (A Report on the Status of Forest Regeneration, 1992 from Canadian Forest Inventory Committee).

**Protection:** leaving a natural area in its natural state where management for ecological objectives, but not for consumptive use, may be allowed, (Ontario, Old Growth Policy Advisory Committee, 1992).

**Regeneration:** the renewal of a tree crop whether by natural (self-sown seed or by vegetative means) or artificial means (sowing and planting). This term may also be used to describe the young crop itself (OMNR, Timber Management Planning Manual, 1986).

**Rotation:** the planned number of years between the formation or regeneration of a crop or stand and its final cutting at a specified age of maturity. The age at harvesting is termed the rotation age when it coincides with the rotation, and the removal age when it does not. In a selection forest, the mean exploitable age replaces the rotation age (Ford-Robertson, Terminology of Forest Science, Technology Practice and Products).

**Seed-tree (harvesting operation):** a clear cut save for a small number of seed bearers left singly or in small numbers, (OMNR, Timber Management Planning Manual, 1986).

**Shelterwood Cut:** the removal of mature trees in a series of two or more cuts (in either entire stands or alternating strips); trees left standing provide seed and cover conditions for natural or artificial regeneration, (OMNR, "Forest Files", Spring 1988).

**Shelterwood System:** a silvicultural system where mature trees are harvested in a series of two or more cuts for the purpose of obtaining natural regeneration under shelter of the residual trees, (adapted from OMNR, Timber Management Planning Manual, 1986).

**Silviculture:** the science and art of cultivating forest crops; the theory and practice of controlling composition, constitution and growth of forests, (OMNR, "Forest Files", Spring 1988).

**Site:** an area defined by specific environmental conditions, such as soil, drainage, slope, soil type, etc.

**Site District:** a subdivision of a site region based on a characteristic pattern of landscape features, (Ontario Provincial Parks and Management Policies, 1978).

**Site Region:** an area of land within which the vegetation responds to the influences of landform in a consistent pattern, (Ontario Provincial Parks Planning and Management Policies, 1978).





**Snag:** a standing dead tree, valued for its contribution to structural diversity and its habitat function.

**Spatial Configuration on the Landscape:** PAC uses this term in the context of the favouring of sites that reduce forest fragmentation and build on contiguous areas or provide for corridors.

**Species Associations:** Common combinations of plants including trees which occur on similar site conditions and associated wildlife.

**Stand:** a community of trees possessing sufficient uniformity in composition, age, arrangement, or condition to be distinguishable from adjacent communities, so forming an ecological entity (OMNR, Timber Management Planning Manual, 1986).

**Stand Management:** management involving decisions relating to the species composition and physical structures of a stand (areas in the order of 10 to 100 hectares).

**Succession:** the natural progression in the life of the forest, where one plant community is gradually replaced with another.

**Sustainable Use:** use of an organism, ecosystem or other renewable resource at a rate within its capacity for renewal, (IUCN/UNEP/WWF, Caring for the Earth, 1991).

**Sustainable Development:** development which meets the needs for the present generation without compromising the ability of future generations to meet their own needs. (World Commission on Environment and Development, 1987).

**Tolerant Tree Species:** trees that can grow under a forest canopy in shade conditions (ex. hard maple).

**Wild Life:** all wild mammals, birds, reptiles, amphibians, fishes, invertebrates, plants, fungi, algae, bacteria, and other wild organisms, (OMNR, Looking Ahead: A Wild Life Strategy for Ontario, 1991).

**Working Group:** an inventory aggregation for management purposes; an aggregate of stands, including potential forest areas assigned to this category, having the same predominant species, and managed under the same rotation and broad silvicultural system, (OMNR Timber Management Planning Manual, 1986).











3 1761 11547200 3

